

88035207



# RANGELAND REFORM '94

*Draft Environmental Impact Statement*

PREPARED BY  
THE DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT  
IN COOPERATION WITH  
THE DEPARTMENT OF AGRICULTURE  
FOREST SERVICE



THE SECRETARY OF THE INTERIOR  
WASHINGTON

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Dear Reader:

This is the draft environmental impact statement on *Rangeland Reform '94* for your review. This draft analyzes the impacts of five management alternatives and seven alternative fee formulas. I would appreciate receiving your comments on any inaccuracies or discrepancies you might find in this draft; your views regarding the adequacy of the analysis; and your recommendations on any new impacts, alternatives, or mitigation measures that should be addressed.

The intent of *Rangeland Reform '94* is to

- make the Forest Service and the Bureau of Land Management's rangeland management programs more compatible with ecosystem management,
- to accelerate restoration and improvement of the public rangelands,
- to obtain for the public a fair and reasonable payment for the grazing of livestock on public lands, and
- to streamline administrative functions and improve consistency between the agencies.

Since July 1993 we have received more than 12,000 cards and letters. I have met with numerous groups and individuals. The alternatives and impacts presented in this draft are the result of careful analysis of these views and ideas. At this point, no single alternative will be completely satisfactory to most readers. I would therefore appreciate suggestions for modifying the proposal. You might find some ideas in one of the other alternatives. These types of suggestions will be extremely useful for the Secretary of Agriculture and myself as we move forward towards a final decision on how best to manage the public's rangelands.

I would appreciate any views you might have for the final *Rangeland Reform '94*, decisions and I look forward to hearing from you.



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SECRETARY OF THE INTERIOR

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Draft (X)

Final ( )

The United States Department of the Interior, Bureau of Land Management (BLM), with the cooperation of the United States Department of Agriculture, Forest Service.

1. Type of Action: Administrative (X) Legislative ( )
2. Abstract: BLM and the Forest Service are proposing to change policies and regulations within their federal rangeland management programs. These actions are intended to improve and restore a significant portion of rangeland ecosystems and to improve and maintain biodiversity, while providing for sustainable development on lands administered by the two agencies. The two agencies are also proposing to revise the formula used to determine fees charged for grazing livestock on federal lands in the 17 western states.

The Rangeland Reform '94 Draft Environmental Impact Statement (draft EIS) is a national-level, programmatic EIS. It documents the ecological, economic, and social impacts that would result from alternative fee formulas and from reforming, or not reforming, other elements of the federal rangeland management program. Five management alternatives are considered in detail: Current Management (No Action), BLM-Forest Service Proposed Action, Livestock Production, Environmental Enhancement, and No Grazing. Seven grazing fee formula alternatives are also analyzed: Current Public Rangeland Improvement Act (PRIA) (No Action), Modified PRIA, BLM-Forest Service Proposed Action, Regional Fees, Federal Forage Fee, PRIA with Surcharges, and Competitive Bidding.

3. For further information, contact:

Jim Fox  
Bureau of Land Management  
(202) 452-7740

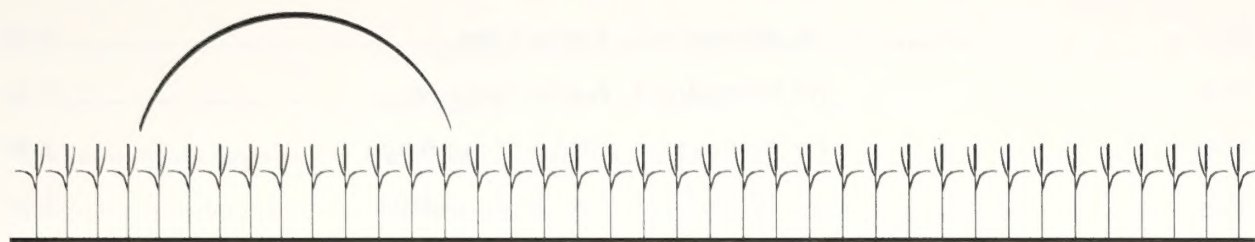
Jerry McCormick  
Forest Service  
(202) 205-1457

4. Comments on the draft EIS must be received no later than: 90 days after the EIS notice of availability is published in the *Federal Register*. Comments should be sent to:

Rangeland Reform '94 EIS  
Bureau of Land Management  
P.O. Box 66300  
Washington, D.C. 20035-6300

Comments on the draft EIS should be as specific as possible and address the adequacy of the EIS or the merits of the alternatives discussed, or both.





# DRAFT ENVIRONMENTAL IMPACT STATEMENT

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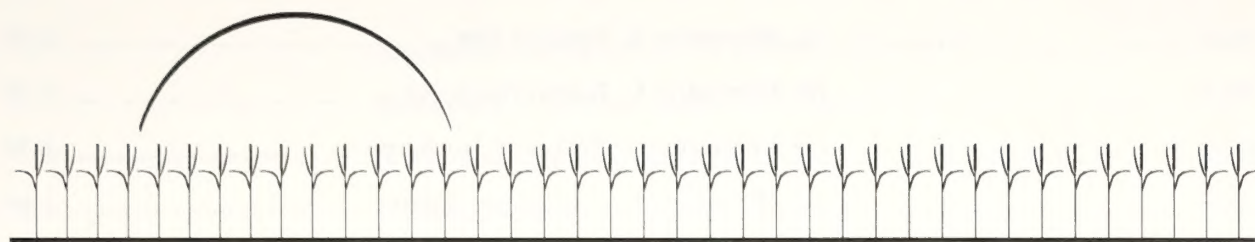
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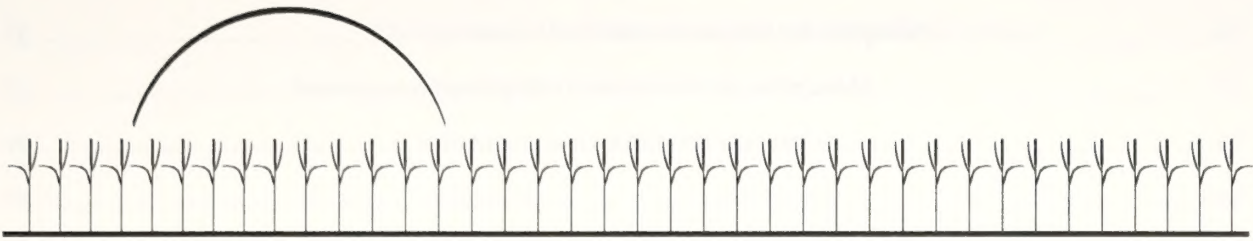
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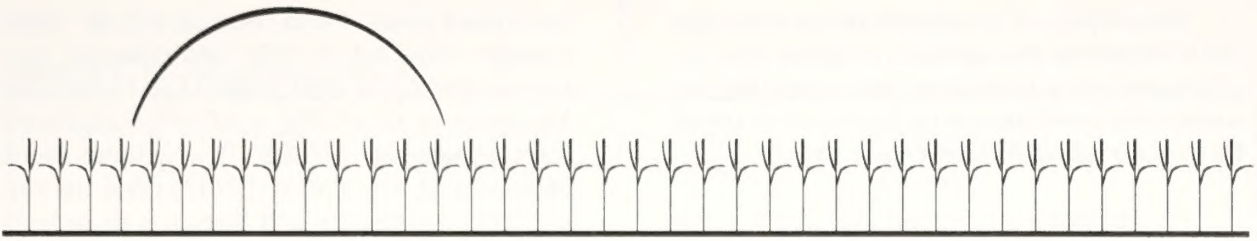
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# EXECUTIVE SUMMARY

## Chapter 1: Purpose and Need

### *Introduction*

*Rangeland Reform '94 is a proposal for managing 270 million acres of federal rangeland administered by the Bureau of Land Management (BLM) and the Forest Service. The proposal was developed cooperatively by the U.S. Department of the Interior and the U.S. Department of Agriculture.*

*Rangelands help shape the character of the American West. They provide habitat for wildlife and natural resources for the economic and spiritual well-being of people and communities. They are relied upon for traditional uses such as livestock grazing and for meeting the growing demands for recreation and tourism.*

*The condition of rangelands has been debated for at least the past decade. The Secretaries of the Interior and Agriculture recognize that management changes since the 1930s have brought improvements. But there is still much progress to be made.*

*Rangeland ecosystems are not functioning properly in many areas of the West. Riparian areas are widely depleted and some upland areas produce far below their potential. Soils are becoming less fertile.*

*Rangeland Reform '94 is a call to take a broader view of how public resources are used and managed. It asks to restore the health of the land, not just for its own sake, but because the prosperity and quality of life of the West depend on it.*



The purpose of rangeland reform is to carry out a rangeland management program that improves ecological conditions, while providing for sustainable development on lands administered by the two agencies. These goals are to:

- Manage public rangelands in a manner that is compatible with principles of ecosystem management.
- Accelerate the restoration and improvement of public rangelands.
- Streamline BLM and Forest Service grazing administration and reduce administrative costs.
- Establish a fair and equitable grazing fee.

It is equally important that these reforms occur in a manner that is sensitive to the needs of local communities dependent upon livestock grazing of public lands. Rangeland Reform would not ultimately be successful if it causes unnecessary or unacceptable impacts on these communities.

Rangeland Reform '94 would meet these needs through policy and regulation changes in three key areas:

1. Development of BLM standards and guidelines for rangeland ecosystems.
2. Changes in BLM and Forest Service grazing administration regulations.
3. Changes in the grazing fee formula.

BLM's main authority to manage public rangelands is established by the Federal Land Policy and Management Act of 1976 (FLPMA), the Taylor Grazing Act (TGA) of 1934, and the Public Rangelands Improvement Act of 1978 (PRIA). Through this authority, BLM is responsible for managing resources on public lands in a manner that maintains or improves them.

The Forest Service's primary authority for managing National Forest System land is established by the Organic Administration Act of 1897,

Bankhead-Jones Farm Tenant Act of 1937, Granger-Thye Act of 1950, Multiple-Use Sustained-Yield Act of 1960, Federal Land Policy and Management Act of 1976, and Public Rangelands Improvement Act of 1978. The National Forest Management Act of 1976 (NFMA) gives the Forest Service authority and direction to provide for the multiple use and sustained yield of products and services from the National Forest System.

## *Administrative Actions*

The proposed changes in rangeland policies and regulations are being evaluated and implemented through related administrative actions. One action is preparation of the Rangeland Reform '94 Draft Environmental Impact Statement (EIS). The other actions are preparation of separate BLM and Forest Service rulemakings. ("Rulemaking" is the process for developing or changing federal regulations.)

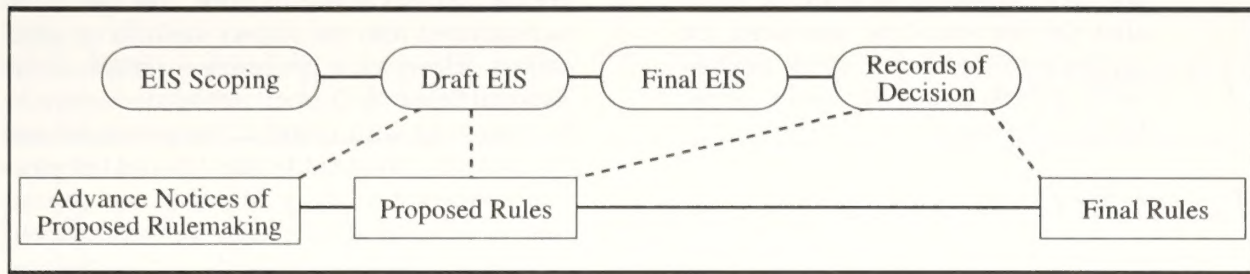
The Rangeland Reform '94 EIS presents an analysis of the reform proposal and several alternatives, a broad, national-level analysis that will serve as a basis for later regional or site-specific analyses that may be needed to implement the selected rangeland management program.

After a 90-day comment period on the draft EIS, the BLM and Forest Service will publish a final EIS that incorporates comments and refines the environmental analysis. After the EIS is published, the Secretaries of the Interior and Agriculture will issue separate records of decision. The records of decision and rulemakings are separate because the agencies operate under different regulatory authorities.

The rulemaking process began in August 1993 when the agencies published the Rangeland Reform '94 proposal as Advance Notices of Proposed Rulemaking. This process will continue through publication of proposed rules and final rules. The proposed rules are being issued for comment at the same time as the draft EIS. The final rules will be published after the Secretaries review comments on the proposed rules and draft EIS, and issue the final EIS and records of decision. See Figure S-1.



Figure S-1: The Administrative Process



## Scoping and Use of Public Comments

An extensive public participation process was conducted to help define the issues and alternatives to be addressed in the draft EIS. The Secretary of the Interior, with the cooperation of the Department of Agriculture, held five Grazing Town Hall meetings in the West during the spring of 1993. Thousands attended. The agencies then conducted a scoping period between July 13 and October 20, 1993, on the draft EIS and solicited comments on the Advance Notices of Proposed Rulemaking. Comments were received from more than 8,000 persons and organizations.

The public comments substantially influenced the draft EIS. Three of the five rangeland management alternatives were developed in response to issues and comments raised during scoping. Four of the seven grazing fee alternatives were derived from public comments.

The rangeland management alternatives are:

- (1) Current Management
- (2) BLM-Forest Service Proposed Action
- (3) Livestock Production
- (4) Environmental Enhancement
- (5) No Grazing

The fee alternatives are:

- (1) Current Fee Formula
- (2) Modified Public Rangelands Improvement Act (PRIA) formula

- (3) BLM-Forest Service Proposed Action
- (4) Regional Fees
- (5) Federal Forage Fee
- (6) PRIA with Surcharges
- (7) Competitive Bidding

The EIS analyzes the impacts of these alternatives, including an analysis of each management alternative combined with a high, moderate, and low fee option.

As a result of public comment, the Proposed Action in the draft EIS has been modified from the initial reform proposal released in August 1993, as follows:

- BLM standards and guidelines for rangeland ecosystems would be developed at the state or regional level with public involvement. They must meet published national requirements and be developed within 18 months of the Secretary's record of decision. If regional standards and guidelines are not in place after 18 months, fallback standards and guidelines would take effect.
- Multiple resource advisory councils would be established at the local level and provide a mechanism for meaningful, issue-specific public involvement including the development of state or regional standards and guidelines.
- The Proposed Action would establish 1996 as the base year for the forage value index. The forage value index would not be used to annually adjust the fee in response to market conditions until

the year 1997. This proposed rule would establish the 1995 grazing fee at \$2.75, and the 1996 grazing fee at \$3.50. Thereafter the fee would be calculated, except as provided below, using the base value of \$3.96 multiplied by the revised forage value index.

## ***Issues Not Addressed***

Most of the issues raised during scoping are incorporated in alternatives or addressed as impacts in the EIS. But, several issues are not addressed because they are beyond the scope of the document or did not meet the basic purposes of rangeland reform.

The following are examples of issues not addressed in the EIS:

- Broaden the scope of the document to include state agencies, the U.S. Fish and Wildlife Service, and other federal agencies.
- Overhaul the wild horse and burro program and include it in the EIS.
- Have states and counties manage federal rangelands.

The National Research Council published a report in January 1994 entitled *Rangeland Health, New Methods to Classify, Inventory and Monitor*

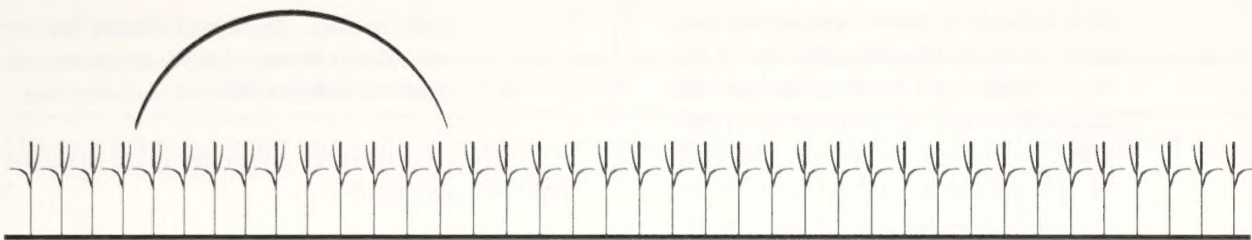
*Rangelands* (National Research Council, 1994). This document was released as the Rangeland Reform EIS was going to print, too late to be incorporated into the impact analysis or alternatives. However, a preliminary review of the National Research Council publication seems to be consistent with many of the proposals and the analysis contained in this EIS and information contained in the publication was considered in developing direction for development of state or regional standards and guidelines. The BLM and Forest Service intend to thoroughly review this recent report and consider the information it contains during the preparation of the Final EIS. Public comment on the information in the report is invited.

## ***Analysis Area***

BLM management policies described in the EIS would apply to all the rangelands it manages. These rangelands occur in 15 western states. Forest Service management policies would apply to all national forests and grasslands.

The grazing fee policies described in the EIS would apply to the 17 western states where BLM and the Forest Service manage rangelands. They would not apply to the eastern states because BLM does not manage rangelands there and the fee is determined by fair market value or competitive bid on national forests and grasslands.





# EXECUTIVE SUMMARY

## Chapter 2: Description of Alternatives

*The draft EIS analyzes five rangeland management alternatives and seven fee alternatives. The management alternatives address nonfee aspects of the BLM and Forest Service rangeland management programs. For BLM these aspects include changes to policy regulations controlling the administration of the rangeland program and development of standards and guidelines. For the Forest Service these aspects include only changes in policy and regulations because the Forest Service already has an equivalent to standards and guidelines in their individual forest plans.*

### ***Management Alternatives***

*The five management alternatives analyzed in detail in the EIS are:*

1. *Current Management* - Would continue existing policies, management decisions, and prescriptions.
2. *BLM-Forest Service Proposed Action* - Would change BLM and Forest Service rangeland policies and regulations, including development of national requirements and state or regional standards and guidelines for BLM, and changes in the grazing fee formula for both agencies. Multiple resource advisory councils for BLM would be established at the local level. The intent of the Proposed Action is



to establish a more consistent program between the two agencies, to improve rangeland conditions and the administration of the rangeland program, to provide for meaningful public involvement, and to provide for equitable grazing fees while contributing to the sustainability of federal rangelands.

3. *Livestock Production* - Would allow permittees to continue grazing their livestock at current permitted levels. Permittees would be given increased control of rangeland management. BLM standards and guidelines would be developed at the regional level by grazing advisory boards.
4. *Environmental Enhancement* - Would limit livestock grazing to areas in proper functioning condition and permanently exclude grazing from areas determined to be unsuitable. These areas include: designated and recommended wilderness areas, critical habitat for threatened and endangered species (as determined by the Fish and Wildlife Service), and developed recreation sites.
5. *No Grazing* - Would eliminate grazing on public lands over a 3-year phase-

out period. BLM and Forest Service could use livestock to manage vegetation to achieve resource objectives.

Tables S-1 through S-5 summarize the management alternatives.

## *Fee Alternatives*

Seven fee alternatives are detailed in the EIS:

1. PRIA (No Action)
2. Modified PRIA
3. BLM-Forest Service Proposal
4. Regional Fees
5. Federal Forage Fee
6. PRIA with Surcharges
7. Competitive Bidding

In Chapter 4 of the EIS, each management alternative and the cumulative impacts are analyzed. Chapter 4 also includes an extensive analysis of a high, moderate and low fee combined with each of the management alternatives.

Table S-6 summarizes the fee alternatives.



**Table S-1: Management Alternative 1 - Current Management (No Action)**

<b>National Requirements and Standards and Guidelines</b>	BLM has no comprehensive national requirements or rangeland management standards.	The Forest Service has set national rangeland management policy and establishes standards and guidelines within forest plans.
<b>Leasing</b>	BLM requires permittees to own or control both livestock and base property and assesses no surcharge.	The Forest Service does not allow leasing of livestock or base property.
<b>Foreign Corporations</b>	BLM requires that a permittee be a U.S. citizen or a group or association authorized to conduct business in the state in which the grazing use is sought, all members of which are U.S. citizens, or a corporation licensed to conduct business in the state in which grazing use is sought.	The Forest Service requires that a permittee be a U.S. citizen or a corporation at least 80 percent owned by U.S. citizens.
<b>Disqualification</b>	Neither agency allows a permittee or applicant to be disqualified from applying for or holding another permit because of conduct or performance.	
<b>Prohibited Acts</b>	BLM defines prohibited acts to include violations of the following two specific environmental laws: The Bald Eagle Protection Act and the Endangered Species Act.	The Forest Service can cancel grazing permits when a permittee is convicted of violating federal or state environmental laws.
<b>Grant Policy</b>	BLM gives priority to existing BLM permittees when authorizing grazing permits. BLM does not consider past compliance with permit terms as a criterion.	The Forest Service has some criteria for granting grazing privileges, but livestock permittee performance is not a prime consideration.
<b>Permit Tenure</b>	Both agencies usually issue permits for 10 years.	
<b>Unauthorized Use</b>	BLM has no policy to differentiate incidental use that causes no resource damage from willful trespass. All unauthorized use is regarded formally as trespass. Three different fees are assessed for willful trespass depending on the circumstances.	The Forest Service has discretion to exempt small unintentional use from formal procedures and fines.
<b>Nonuse</b>	BLM managers can approve annual nonuse for conservation or personal business reasons.	The Forest Service may authorize up to 3 years of nonuse on an annual basis for personal convenience or up to the permit term for resource protection.
<b>Suspended Nonuse</b>	BLM grazing permits can contain both active and suspended nonuse animal unit months.	The Forest Service does not recognize suspended nonuse on its grazing permits.

*continued...*





**Table S-1 (concluded): Management Alternative 1 - Current Management (No Action)**

<b>Water Rights</b>	Both agencies recognize the key role of the states in water rights issues. Since the 1980s, BLM policy has been not to apply for water rights for grazing purposes (this policy was not universally applied). Generally, both agencies apply for rangeland improvement water rights under state law and protest private applications for water rights on lands they administer, although in some cases BLM does not. Where permittees and BLM complete water developments under cooperative agreements, BLM sometimes files as co-owner of the water rights. Where permittees finance the entire water development on BLM-administered land, they may file for sole ownership of the water right. The Forest Service files for sole ownership of the water right where permitted by state law whenever livestock water is developed on National Forest System lands.	
<b>Range Improvement Ownership</b>	BLM permittees who totally fund authorized range improvements retain title. BLM retains ownership of authorized range improvements completed under cooperative agreements.	The Federal Government owns all permanent improvements on Forest Service-administered land.
<b>Range Betterment Fund Distribution</b>	Half of receipts returned to BLM are dispersed to the district of origin, and under current policy the other half are allocated by the Secretary of the Interior.	Under Forest Service regulations, half of receipts are distributed to the forest of origin with regional foresters able to assign half to any forest within their region.
<b>Range Betterment Fund Use</b>	BLM uses Range Betterment Funds for building range improvements.	The Forest Service uses Range Betterment Funds for on the ground project planning and building rangeland improvements.
<b>Appeals</b>	BLM decisions are automatically stayed upon appeal unless emergency regulations are invoked.	The Forest Service does not allow decisions under appeal to automatically be stayed.
<b>Grazing Advisory Boards</b>	BLM has grazing advisory boards.	The Forest Service does not have grazing advisory boards.
<b>Service Charge/ Transaction Fee</b>	BLM has a \$10 service charge for processing paperwork.	The Forest Service may charge a \$35 fee only if a permittee wants to split a billing period.
<b>Rangeland Ecosystems</b>	Neither BLM nor the Forest Service has regulations specifically addressing the management of rangeland ecosystems.	





**Table S-2: Management Alternative 2 - BLM - Forest Service Proposed Action**

<b>National Requirements and Standards and Guidelines</b>	The proposed action would establish national requirements for managing rangeland ecosystems on BLM lands. State or regional standards and guidelines would meet these national requirements and would be developed within 18 months of the Secretary's record of decision. If they are not put in place after 18 months, fallback standards and guidelines would take effect.	The Forest Service would continue to formulate standards and guidelines for rangeland management while it prepares national forest land and resource management plans.
<b>Leasing</b>	BLM would allow base property and pasture leases. A 20 percent surcharge would be applied to base property leases, a 50 percent surcharge would be applied to pasture leases and a 70 percent surcharge would be applied if both are involved. Sons and daughters of permittees and lessees would be exempted from surcharges.	The Forest Service would not allow leasing.
<b>Foreign Corporations</b>	BLM and Forest Service permittees would have to be either U.S. citizens or a group or association authorized to conduct business in the state in which the grazing use is sought, all members of which are U.S. citizens, or a corporation licensed to conduct business in the state in which grazing use is sought.	
<b>Disqualification</b>	BLM and the Forest Service would not issue new or additional grazing permits or leases to applicants whose federal grazing permits have been canceled during the prior 3 years due to violations of the terms and conditions of the permit, or to applicants who have had state grazing permits or leases canceled during the prior 3 years due to violations of the terms and conditions of the permit or lease for lands within the grazing allotment for which the federal permit or lease is sought.	
<b>Prohibited Acts</b>	BLM and Forest Service permits could be canceled or suspended for violation of federal or state laws or regulations concerning pest or animal damage control, or conservation or protection of natural or cultural resources or environmental quality if public lands are involved or affected. No action would be taken unless the permittee or lessee has been convicted or otherwise determined to be in violation and no further appeals are outstanding.	
<b>Grant Policy</b>	Both agencies could issue grazing permits for new or unallocated forage to operators who have proven their ability to improve or maintain the condition of rangeland ecosystems.	
<b>Permit Tenure</b>	Both agencies would continue to generally issue permits for 10-year periods.	
<b>Unauthorized Use</b>	Both agencies would exempt small, unintentional trespass from formal procedures and fines and apply one of three different fees for willful trespass, depending on the circumstances and seriousness of the trespass.	
<b>Nonuse</b>	Both agencies could authorize conservation use for extended periods when needed to meet resource management objectives. Conservation use for resource management could be granted for up to the full 10 years of the permit. Nonuse for personal reasons could be granted for up to 3 years.	

*continued...*





**Table S-2 (concluded): Management Alternative 2 - Proposed Action**

<b>Suspended Nonuse</b>	BLM grazing permits would contain both active and suspended nonuse AUMs.	The Forest Service would not authorize suspended nonuse.
<b>Water Rights</b>	<p>The Proposed Action provides consistent direction for the BLM regarding water rights on public lands for livestock grazing purposes. It is intended to generally make BLM's policy consistent with Forest Service practice, and with BLM policy prior to being changed in the early 1980s.</p> <p>Under the Proposed Action, any new rights to water on public lands to be used for livestock watering on those lands will be acquired, perfected, maintained, and administered under state law, and in the name of the United States unless state law prohibits it.</p> <p>The proposal does not create any new federal reserved water rights. Any right or claim to water on public lands for livestock watering on public land by or on behalf of the United States remains subject to the provisions of 43 U.S.C. 666 (the McCarran Amendment), and section 701 of Public Law 94-579 (the Federal Land Policy and Management Act disclaimer on water rights). Finally, it does not change existing BLM policy on water rights for non-livestock-related uses, such as irrigation, municipal or industrial uses.</p>	
<b>Range Improvement Ownership</b>	Subject to valid existing rights, BLM and the Forest Service would hold title to all future permanent range improvements. Valid existing rights to range improvements and compensation therefor under the Federal Land Policy and Management Act would not be affected. A permittee's or lessee's contribution toward new permanent range improvements would be documented for proper credit.	
<b>Range Betterment Fund Distribution</b>	BLM policy would become consistent with current Forest Service policy. Twenty-five percent of BLM grazing receipts collected would be returned to the district of origin and the remaining 25 percent would be distributed at the state director's discretion.	
<b>Range Betterment Fund Use</b>	For both agencies Range Betterment Funds would be used for range improvements and for a wider range of activities needed to maintain and improve ecosystem health including, monitoring, planning, engineering, environmental assessments, and construction.	
<b>Appeals</b>	Parties affected by grazing administration decisions are allowed 30 days in which to file an appeal and a request to stay implementation of the decision. BLM and Forest Service would review requests to stay rangeland management decisions within 45 days. Unless granted, a petition for stay could provide a maximum 75-day period before final decisions are in place.	
<b>Grazing Advisory Boards</b>	BLM grazing advisory boards would be replaced by multiple resource advisory councils consisting of a diverse group representing a wide array of perspectives within communities to advise the BLM on restoring and maintaining proper functioning condition of public rangelands.	
<b>Service Charge/ Transaction Fee</b>	BLM and Forest Service transaction fees would be consistent.	
<b>Rangeland Ecosystems</b>	Both agencies would emphasize and implement policies to manage rangeland resources using an ecosystem approach.	





**Table S-3: Management Alternative 3 - Livestock Production**

<b>National Requirements and Standards and Guidelines</b>	BLM would have standards and guidelines developed regionally by permittees and grazing advisory boards.	The Forest Service would continue to develop local standards and guidelines within forest plans.
<b>Leasing</b>	BLM and the Forest Service would allow base property and pasture management leases without a surcharge.	
<b>Foreign Corporations</b>	BLM and the Forest Service would prohibit foreign corporations from holding federal grazing permits.	
<b>Disqualification</b>	The local grazing advisory boards would determine permittee qualifications for both agencies.	
<b>Prohibited Acts</b>	BLM would define prohibited acts to include violations of only two specific statutes, the Bald Eagle Protection Act and the Endangered Species Act.	The Forest Service would cancel grazing permits when a permittee is convicted of violating federal or state environmental laws.
<b>Grant Policy</b>	Both agencies would issue grazing permits for new or unallocated forage to operators who have proven their ability to improve or maintain the condition of rangeland ecosystems.	
<b>Permit Tenure</b>	For both agencies, permit tenure lengths would be 10 years minimum and 20 years for good stewardship.	
<b>Unauthorized Use</b>	Small, unintentional trespass would be exempt from formal procedures and fines for both agencies. One fee would be charged for willful or repeated willful unauthorized use.	
<b>Nonuse</b>	BLM and Forest Service could authorize up to 5 years of nonuse for permittee personal convenience and year-to-year nonuse for resource protection.	
<b>Suspended Nonuse</b>	BLM grazing permits could contain both active and suspended nonuse animal unit months.	The Forest Service would not recognize suspended nonuse.
<b>Water Rights</b>	BLM and the Forest Service would allow grazing permittees to file for water rights on public land for stock watering developments.	
<b>Range Improvement Ownership</b>	BLM and the Forest Service would hold title to range improvements. Permittees would hold financial interest to improvements in proportion to their contributions.	
<b>Range Betterment Fund Distribution</b>	Fifty percent of all grazing fees collected would be returned to the forest or BLM district of origin.	
<b>Range Betterment Fund Use</b>	BLM would use range betterment funds solely for building range improvements.	The Forest Service would use Range Betterment Funds for planning and building rangeland improvements.
<b>Appeals</b>	BLM decisions would be automatically stayed upon appeal, unless emergency regulations are invoked.	The Forest Service would not allow a decision under appeal to automatically be stayed.
<b>Grazing Advisory Boards</b>	Both agencies would have grazing advisory boards with expanded roles in public involvement, planning, decisionmaking, monitoring, and setting resource management objectives.	

*continued...*





**Table S-3 (concluded): Management Alternative 3 - Livestock Production**

<b>Service Charge/ Transaction Fee</b>	BLM and the Forest Service would eliminate all service charges and transaction fees.
<b>Rangeland Ecosystems</b>	Goals and objectives for rangeland ecosystems would be set through consultation with grazing advisory boards.



**Table S-4: Management Alternative 4 - Environmental Enhancement**

<b>National Requirements and Standards and Guidelines</b>	Regional standards and guidelines would be established for BLM lands in addition to national standards and guidelines.	Detailed policy would be formulated for the Forest Service to complement standards and guidelines now included in Forest Service land and resource management plans.
<b>Leasing</b>	Neither BLM nor the Forest Service would allow leasing.	
<b>Foreign Corporations</b>	BLM and Forest Service permittees would have to be either U.S. citizens or businesses licensed in the U.S.	
<b>Disqualification</b>	Both BLM and the Forest Service would prohibit permittees from holding grazing permits for up to 3 years if they have had any federal grazing permits canceled for violating federal grazing regulations.	
<b>Prohibited Acts</b>	BLM and Forest Service permits could be canceled for violation of federal or state resource protection laws.	
<b>Grant Policy</b>	Forage could not be allocated above current preference or permitted numbers, even after desired conditions are reached.	
<b>Permit Tenure</b>	Ten-year term grazing permits would be issued only to permittees who have records of substantial compliance with terms of permits.	
<b>Unauthorized Use</b>	Both agencies would exempt small, unintentional trespass from formal procedures and fines and would assess three different fees for willful trespass, depending on circumstances.	
<b>Nonuse</b>	BLM and the Forest Service would automatically approve nonuse for up to 10 years.	
<b>Suspended Nonuse</b>	Suspended nonuse would be eliminated from BLM grazing permits, making BLM and the Forest Service policy consistent.	
<b>Water Rights</b>	BLM would assert claims and rights to water developed on public lands for the benefit of public resources and uses. Existing rights held by other parties on public or other lands would not be affected. BLM and Forest Service water rights policies would be consistent.	
<b>Range Improvement Ownership</b>	BLM and the Forest Service would hold title to all future permanent range improvements.	
<b>Range Betterment Fund Distribution</b>	Consistent with current Forest Service policy, 25 percent of BLM grazing receipts would be returned to the district of origin and the remaining 25 percent would be returned to BLM state offices for discretionary disbursement.	The Forest Service would continue its current policy.
<b>Range Betterment Fund Use</b>	For both agencies, Range Betterment Funds would be used for a wider range of activities needed to maintain and improve ecosystem health, including monitoring, planning, environmental assessments, engineering, and construction. Range Betterment Funds would not be limited to livestock-related projects.	
<b>Appeals</b>	Both agencies would implement decisions automatically unless a stay of the decision is requested or granted.	
<b>Grazing Advisory Boards</b>	Grazing advisory boards would be eliminated. Joint BLM-Forest Service resource advisory councils would be established on an ecoregion basis.	

*continued...*



**Table S-4 (concluded): Management Alternative 4 - Environmental Enhancement**

<b>Suitability</b>	Livestock grazing would be limited to areas that data shows are in proper functioning condition. Livestock would also be excluded from areas determined to be sensitive or unsuitable for grazing. Grazing might be allowed on areas with formerly unacceptable rangeland health when conditions improve and proposed management would not cause conditions to deteriorate.
<b>Service Charge/ Transaction Fee</b>	Both BLM and the Forest Service would collect administrative service charges.
<b>Rangeland Ecosystems</b>	BLM and Forest Service regulations would emphasize managing all uses, including livestock grazing, to sustain ecosystem biodiversity.





**Table S-5: Management Alternative 5 - No Grazing**

<b>National Requirements and Standards and Guidelines</b>	Not needed. The Forest Service would continue to develop standards and guidelines in forest plans as needed.
<b>Leasing</b>	Would not apply.
<b>Foreign Corporations</b>	Would not apply.
<b>Disqualification</b>	Would not apply.
<b>Prohibited Acts</b>	Would not apply.
<b>Grant Policy</b>	Would not apply.
<b>Permit Tenure</b>	All permits issued for crossing or vegetation management would be temporary.
<b>Unauthorized Use</b>	Both agencies would enforce rules on unauthorized use of federal lands.
<b>Nonuse</b>	Would not apply.
<b>Suspended Nonuse</b>	Would not apply.
<b>Water Rights</b>	Would not apply. Water rights filings would follow existing state law.
<b>Range Improvement Ownership</b>	All range improvements would be owned by the Federal Government.
<b>Range Betterment Fund Distribution</b>	A Range Betterment Fund would not exist.
<b>Range Betterment Fund Use</b>	Would not apply.
<b>Appeals</b>	Appealed decisions would no longer be stayed automatically.
<b>Grazing Advisory Boards</b>	Would not be needed.
<b>Service Charge/ Transaction Fee</b>	A service charge would continue to be applied for trailing permits as specified in current regulations.
<b>Rangeland Ecosystems</b>	Where needed, livestock would be used to help reach or maintain vegetation objectives.



**Table S-6: Fee Alternatives**

<b>PRIA (No Action)</b>	The fee alternative based on the Public Rangeland Improvement Act (PRIA) consists of a base value of \$1.23 per AUM that is updated annually using three indexes. The indexes consider the change in forage value, the change in beef cattle prices, and prices paid for selected items purchased by permittees. The annual fee would not differ by more than 25 percent from the fee charged in the previous year.
<b>Modified PRIA</b>	The Modified PRIA alternative would use the same base as PRIA, \$1.23, but would differ in using an index for <u>all</u> production costs rather than selected production costs as used in the PRIA alternative. The annual fee would not differ by more than 25 percent from the fee charged in the previous year.
<b>BLM-Forest Service Proposal (Proposed Action)</b>	<p>The proposed action would adopt a fee formula using a base value (\$3.96) updated annually by a Forage Value Index. The \$3.96 base value represents a midrange between the results obtained through the use of two methods for estimating a fair base value. The proposed fee would be phased in over the years 1995 through 1997. Thereafter, annual increases or decreases in the grazing fee resulting from changes in the forage value index would be limited to 25 percent of the amount charged the previous year to provide for a measure of stability that would facilitate business planning.</p> <p>This proposal would establish 1996 as the base year for the forage value index. The forage value index would not be used to annually adjust the fee in response to market conditions until the year 1997. This proposed rule would establish the 1995 grazing fee at \$2.75, and the 1996 grazing fee at \$3.50. Thereafter the fee would be calculated, using the base value of \$3.96 multiplied by the revised forage value index. By definition, the forage value index in the year 1997 would equal one; yielding a 1997 grazing fee of \$3.96. In subsequent years the calculated fee would depend on the changes in the market rate for private grazing land leases as reflected by the forage value index.</p> <p>Fee incentive criteria would be developed during the first 2 years of a 3-year fee phase-in period. The third year of the phase-in would not be implemented until the incentive criteria are developed. Instead a base value of \$3.50 would be substituted in 1997.</p>
<b>Regional Fees</b>	The regional fee alternative is the same as the proposed action fee, except that a different base value would be applied to six pricing regions. The regional base values would be derived from the 1983 Federal Land Forage Appraisal (updated in 1992). The regional base values would be annually updated using the FVI. The annual fee would not differ by more than 25 percent from the fee charged in the previous year.
<b>Federal Forage Fee Formula</b>	The federal forage fee formula developed by the Western Livestock Producers Alliance is based on a 3-year average of private grazing land lease rates for 16 western states. The formula uses multipliers of private land lease rates and deducts the updated 1966 nonfee costs as described in the proposed fee alternative. That amount is multiplied by the percentage difference of cash receipts per cow for federal and nonfederal livestock producers. The annual fee would not differ by more than 25 percent from the fee charged in the previous year.

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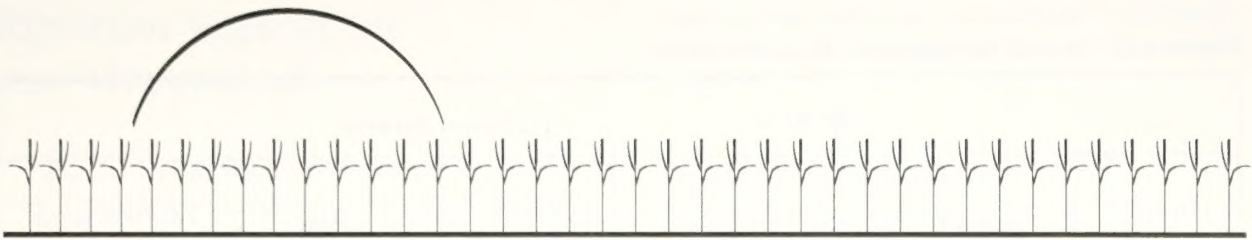


**Table S-6 (concluded): Fee Alternatives**

<b>PRIA with Surcharges</b>	This alternative would use the fee under the PRIA fee alternative (\$1.86 for 1993) and add a surcharge to cover the cost of administering the grazing program at the local Forest Service and BLM administrative level. Each year the fee would be limited to twice the fee produced by the PRIA formula. After a 1-year phase-in, the surcharge would not differ by more than 10 percent from the previous year's surcharge. The 1993 fee range would have been between \$1.86 and \$3.72. For evaluation purposes, the \$3.72 fee is used.
<b>Competitive Bidding System</b>	Under this alternative, competitive bidding would be used to set grazing fees. The successful bidder would be required to adhere to the terms of the permit and perform specific management practices and facilities maintenance. The terms of the permit would be part of the bid process, allowing bidders themselves to estimate the market value of the forage.







# EXECUTIVE SUMMARY

## Chapter 3: Affected Environment

*Chapter 3 describes the natural resources and economic values of rangelands and discusses factors that have influenced current conditions.*

*The rangelands of the American West form a vast and varied landscape. Spanning nine climatic zones and containing diverse soils, vegetation, and wildlife, these rangelands include the hot deserts of the Southwest, the sagebrush plateaus of the Great Basin, the grasslands of the Great Plains, and the understory of Rocky Mountain coniferous forests.*

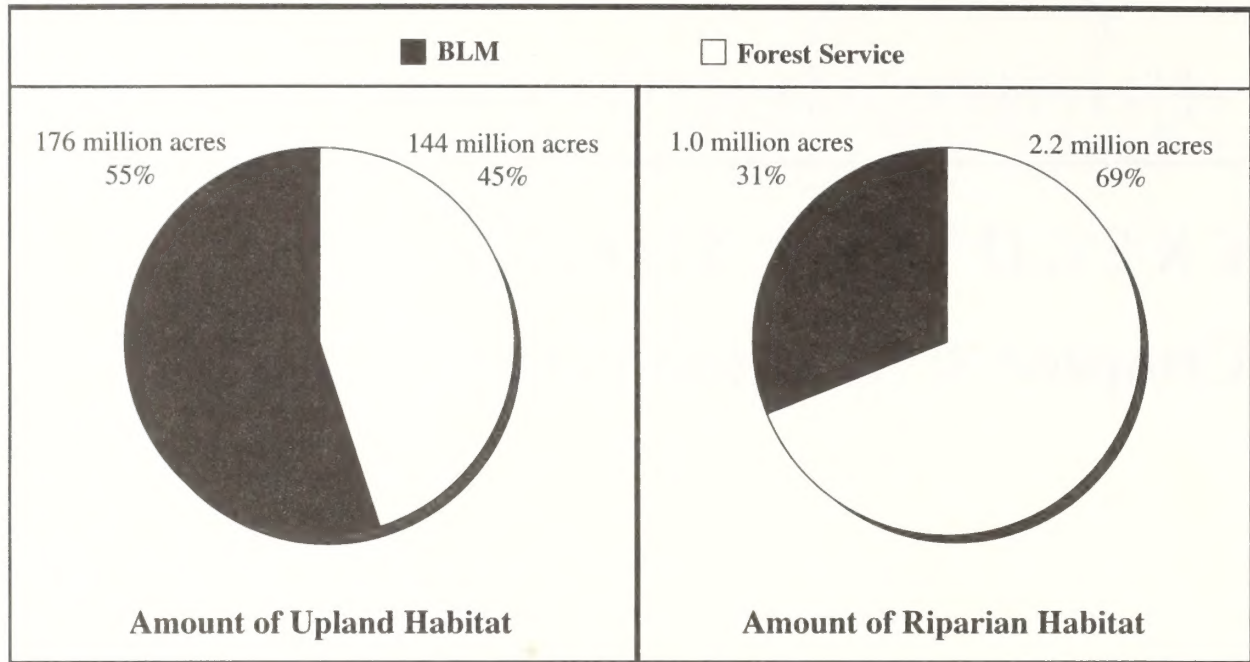
*Rangelands contain two basic types of vegetation communities: upland communities and riparian communities. Upland vegetation communities occur on dry sites and are by far the most widespread. Riparian vegetation communities occur in wet areas and are extremely limited, occupying only 1 percent of rangelands. Figure S-2 shows the amount of upland and riparian habitat managed by the Forest Service and BLM.*

*Rangeland vegetation communities, like all plant communities, change over time due to environmental influences such as climate, fire, insects, and disease. However, since European settlement of the West, rangeland vegetation has been affected predominately by the introduction of livestock grazing and related changes in the occurrence of fire.*

*Livestock grazing began in the southwest in the 1600s and expanded as settlement progressed. By the late 1800s livestock were grazing throughout the West. During this period millions of cattle, sheep, and horses grazed rangeland vegetation that had never before been grazed as intensively. Adverse effects from grazing were apparent prior to the turn of the century.*



Figure S-2: Amount of Upland and Riparian Habitat



## Upland Vegetation and Watersheds

Livestock grazing reduced native grasses and palatable shrubs in upland communities. The overall amount of plants and plant litter covering the ground greatly decreased, exposing bare ground and heightening soil erosion. Since the mid 1930s, upland vegetation condition has shown improvement in many areas.

The reduction in grasses and plant litter disrupted the natural influence of fire on rangelands. Before settlement, fire was a common influence on upland communities. Fire destroys most brush species, but grasses and forbs increase after an area has burned. Frequent fire, caused both by lightning and started deliberately by Native Americans, helped to maintain a patchwork of shrub- and grass-dominated communities of upland vegetation.

With understory grasses and plant litter reduced by grazing, fires started and carried less easily. At the same time, land managers began to aggressively suppress fire. Fire was effectively curtailed on most rangelands except in the hot desert region of the Southwest where plants are

widely spaced and fire was never considered frequent.

Shrub-dominated areas expanded as the grasslands were depleted and fires decreased. For example, sagebrush and pinyon-juniper communities have become more dense and widespread. Plant communities palatable to livestock or maintained by fire, such as native bunchgrasses and quaking aspen, have diminished.

Upland vegetation communities have also been altered by an expansion of annual grasses. The depletion of native grasses created an opportunity for nonnative annual grasses to become established. These invading grasses crowd out native plants, have less value for livestock and wildlife, and burn more readily. The expansion of annual grasses is permanently changing large areas of rangeland vegetation.

Once altered, upland vegetation communities change or improve only gradually. Native grasses revegetate slowly, annual grasses cannot be removed once established, and disturbed or eroded soils require a long time to rebuild. When management improves, upland communities that receive more than 12 inches of annual precipitation have shown improvement within 20 years. Drier areas generally have not improved.



## *Riparian Vegetation and Watersheds*

Riparian vegetation communities make up only 1 percent of rangelands but provide far-reaching values and benefits. Healthy riparian communities stabilize and protect streambanks from erosion. They act like a giant sponge, helping to filter sediments, improve water quality, reduce flooding, recharge groundwater, and maintain streamflow. Riparian areas are also the most biologically productive and diverse habitats on public land. They provide food, water, cover, nesting areas, and protected pathways for wildlife movements and migrations. All fish and nearly all terrestrial wildlife species depend on riparian areas to survive.

The amount and quality of riparian communities have been severely reduced since the settlement period. Although uplands have improved since rangeland management began in the 1930s, riparian areas have continued to decline and are considered to be in their worst condition in history.

Rangeland riparian communities have been influenced by many factors, including flood control and irrigation impoundments, but they have been most affected by livestock grazing. Livestock tend to spend a lot of time in riparian areas because of the lush vegetation, shade, and water. Livestock remove protective vegetation, trample streambanks, and defecate near streams, degrading water quality. Streambank erosion increases, stream channels widen or deepen, and streams lose their ability to absorb, retain, and steadily release water.

When a stream loses these important watershed characteristics, it is said to be nonfunctioning. Nonfunctioning riparian communities cannot provide important watershed values and lack the amount and quality of habitat needed by fish and wildlife.

Once riparian areas become nonfunctioning they usually will not recover without major changes in management. But, because they have moisture, most riparian areas will respond relatively rapidly once disturbance factors are removed. Many riparian areas have improved and begun to function properly within 5 years of management changes. In some cases, restored

riparian habitats have reestablished perennial streamflow in streams that had become intermittent.

## *Evaluating Rangeland Conditions*

Interpreting rangeland conditions has always been controversial. In the past, BLM and the Forest Service have applied field measurement techniques that describe vegetation communities but that do not tell whether overall ecological processes are working properly and meeting watershed and wildlife needs. To reflect this broader view, the agencies are adopting new methods of evaluating rangeland conditions.

The Forest Service has implemented a system based on whether rangeland conditions are meeting resource objectives for a given site. The resource objectives incorporate the fundamental needs and health of the ecosystem. Figures S-3 and S-4 show the present status of National Forest System lands using this system.

BLM is implementing a system based on whether rangeland conditions on a site can sustain natural plant communities and basic ecological functions. This system describes three categories of rangelands:

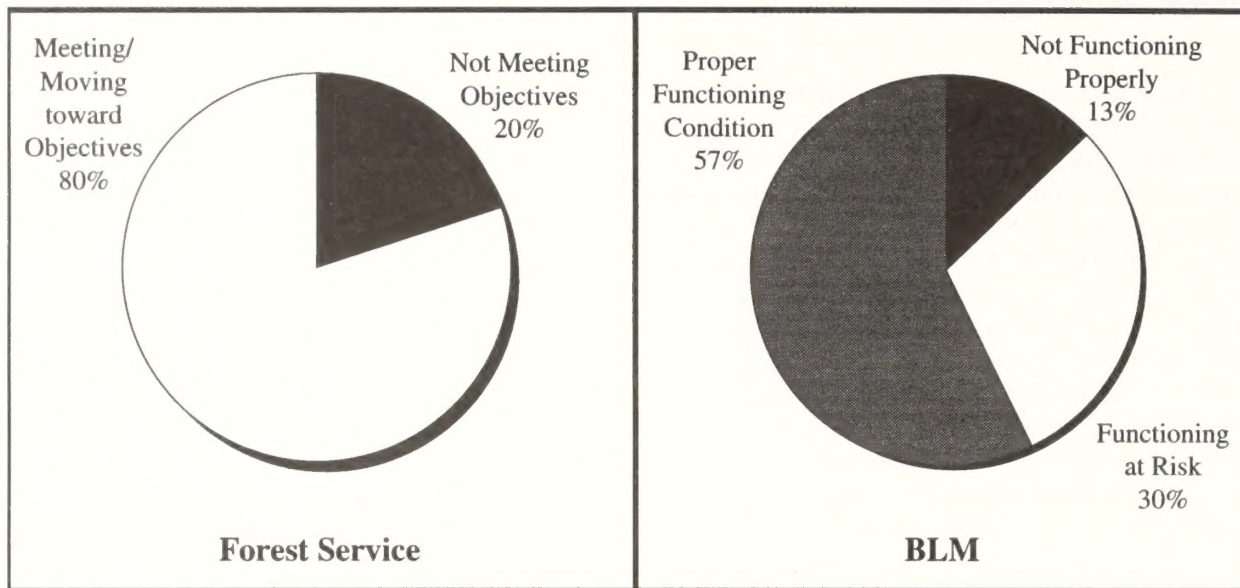
- **Proper Functioning:** when vegetation and ground cover maintain soil conditions that can sustain natural biotic communities.
- **Functioning but Susceptible to Degradation:** when the capabilities of proper functioning areas are threatened by livestock grazing activities.
- **Nonfunctioning:** when vegetation and ground cover are not maintaining soil conditions that can sustain natural biotic communities.

BLM has estimated the functioning condition of rangelands for purposes of analysis in the draft EIS. Figures S-3 and S-4 show the estimated present status of BLM lands using this system.

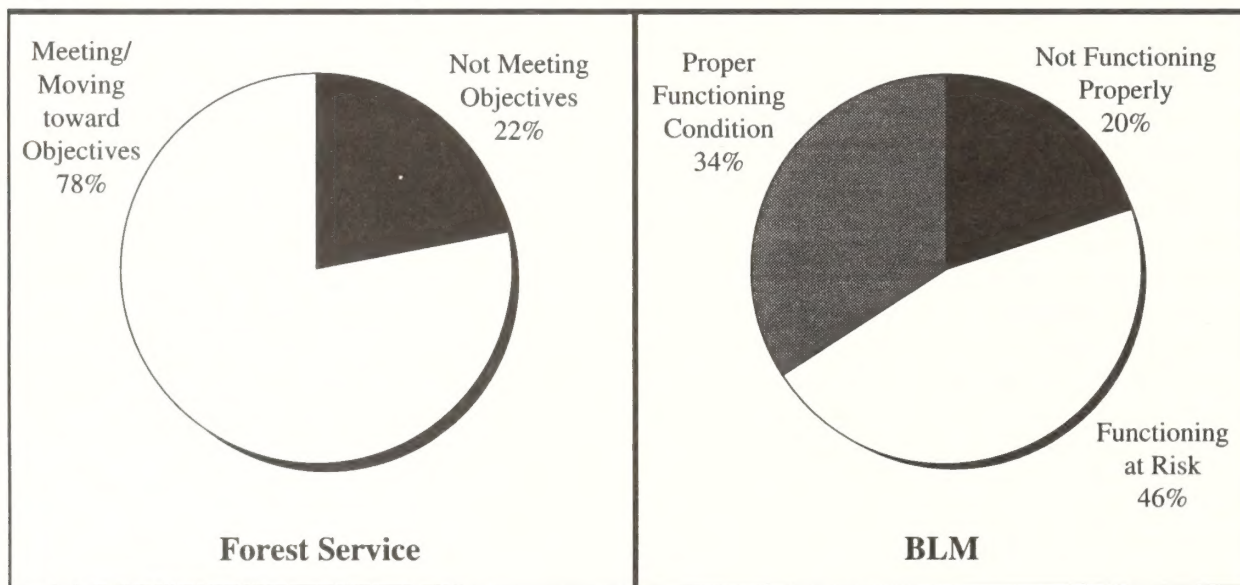




**Figure S-3: Present Condition of Upland Habitat**



**Figure S-4: Present Condition of Riparian Habitat**



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### ***Wildlife and Special Status Species***

More than 3,000 species of mammals, birds, reptiles, fish, and amphibians inhabit public rangelands. Wildlife species and populations vary widely, depending on regional climates and local habitat conditions. Overall, wildlife reflects the diversity and health of rangeland vegetation communities and watersheds.

The changes in rangeland vegetation communities since the settlement period have generally favored wildlife species that use brush-dominated upland communities. Examples are species such as mule deer, black-tailed jack rabbits, and javelina. Populations of most big game species are abundant and stable.

But, many wildlife species associated with native grassland and riparian communities have declined. More than 100 species that use rangelands are listed as federally threatened or en-



dangered species, including the desert tortoise, Utah prairie dog, bald eagle, and Lahonton cutthroat trout. Many other wildlife species are considered in serious decline and have been given sensitive and other protective designations.

The decline in species that depend on riparian communities is especially extensive and alarming. Many species of native fish, upland birds, neotropical migratory birds, and raptors have been greatly affected. For example, more than 100 special status riparian species inhabit Arizona and New Mexico, and most salmon stocks that use rangeland streams are at risk because of poor habitat conditions.

In addition to wildlife, 75 plant species are listed as federally endangered or threatened, and more than 1,100 other plant species are protected because of concern about viability.

## ***Biodiversity***

Resource managers believe that the broad decline in wildlife and plant species, occurring throughout the world, cannot be reversed by managing for individual species. Species are declining because vegetation communities are degraded and natural processes are disrupted. To help species in decline, the health of the underlying resources must be restored. An approach for restoring these resources is managing for biodiversity.

Biodiversity refers to the total amount and variety of plants and animals in an area. The area can be a local site, a watershed, a region, or even larger area. An area that is biologically diverse functions at its highest potential and provides the most stable and productive habitat for plants, wildlife, and people. A primary goal of BLM and Forest Service management is to maintain and enhance biodiversity on the lands they administer.

Managing for biodiversity entails identifying natural processes that do not function properly and changing the responsible actions. The purpose of management is to slow and reverse undesirable ecological processes. For example, in riparian communities management might change livestock grazing to enable vegetation to shade and protect streams, so streams could deposit sediment, repair eroded banks, and restore watershed functions. Wildlife and fisher-

ies habitat would then improve and species could stabilize or recover.

## ***Wild Horses and Burros***

Approximately 46,000 wild horses and 8,000 burros inhabit public rangelands, protected and managed in accordance with the Wild and Free Roaming Horse and Burro Act of 1971. A major objective of the act is to maintain horse and burro populations at levels that are in balance with natural resources. Horses and burros use the same forage as livestock and often directly compete with livestock and wildlife for food and water. Horses also concentrate in and damage riparian areas, particularly during drought. BLM routinely gathers and removes excess animals to maintain suitable populations.

## ***Recreation and Wilderness***

Public lands are used for a variety of recreation activities and use is increasing rapidly. Recorded recreation use on BLM lands exceeded 74 million visitors during 1992. Recreation management is focused on nearly 5,000 developed and 24,000 undeveloped recreation areas and sites. Most of these recreation sites are accessible to livestock.

BLM administers 1.7 million acres of designated wilderness and has recommended that 9.7 million more acres be designated by Congress. The Forest Service manages about 29 million acres of wilderness. Under the 1964 Wilderness Act grazing is not precluded in designated wilderness and presently occurs in many areas. Some areas are not grazed due to the natural lack of forage or inaccessible terrain.

## ***Cultural Resources***

Cultural resources on public rangelands include prehistoric sites dating from about 15,000 years ago and historic sites dating from the beginning of European influence in the 1500s. Cultural resources are divided into cultural properties and traditional lifeway values. A cultural property is a specific location of past human activity, identifiable through field inventory or oral evidence. Rock art, effigy figures, stage coach stops, or abandoned settlements are



examples. A traditional lifeway value is important for maintaining a group's traditional system of religious belief or cultural practice. Examples are Native American use areas for plant collection, vision quests, or other spiritual practices.

Only about 6 percent of BLM administered lands and 12 percent of Forest Service administered lands have been inventoried for cultural resources. About 200,000 sites are considered eligible for designation under the National Historic Preservation Act of 1966. Of these, 1,207 sites totaling 2.8 million acres have been designated as nationally significant cultural resource areas.

The National Historic Preservation Act does not strictly prohibit activities from affecting cultural resources, but protecting cultural resources has become an integral part of BLM and Forest Service management practices.

## *Economic Conditions*

The description of economic conditions addresses the 16 western states where grazing is allowed on federal land: Washington, Oregon, California, Arizona, New Mexico, Colorado, Wyoming, Montana, Idaho, Nevada, Utah, North Dakota, South Dakota, Nebraska, Kansas and Oklahoma. Texas is not included due to the small amount of livestock grazing on federal lands. At times, 11 western states (Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming) are referred to because these states have the highest concentration of federal rangeland.

The economy of the western states is highly diversified. Between 1982 and 1990, employment in all industries grew by 11 million workers. The percentage of total employment has increased in the service, finance, insurance, real estate, construction and retail sectors. Industries that have decreased as a percentage of total employment include: government, manufacturing, agriculture, transportation, communications, utilities, and mining.

As with employment, income in the agriculture sector has declined relative to the rest of the economy. In the 16 western states, income increased by \$350 billion from 1982 to 1990. Although income in the agriculture industry grew between 1982 and 1985, by 1990 the in-

come level had fallen back to its 1982 level. All industries except agriculture grew in income over this period.

The following are some reasons for the above trends.

- Economic conditions made farming less attractive to entrepreneurs and investors.
- Farm incomes declined due to lower output prices and higher costs.
- Land prices, which rose significantly in the 1970s, declined in the 1980s.

Nationally, about 38 percent of the land used for raising cattle is leased. In western states, a substantial amount of federal land is leased, but nearly 70 percent of cattle raisers own all the land they operate.

Beef cattle producers with federal permits make up about 3 percent of the 907,000 producers in the 48 contiguous states. In the 11 western states, federal permittees and lessees make up 22 percent of total beef producers. Sheep producers with federal permits in the 11 western states make up about 19 percent of the total producers.

The importance of federal rangelands varies by the type of animal grazed. In the 16 and 11 western states permitted use makes up about 12 and 25 percent respectively of forage consumed by beef cattle. BLM-administered land makes up about 5 percent of the overall annual feed requirements for sheep operations, and the Forest Service administered lands make up about 6 percent.

The importance of federal rangelands to livestock production can also be measured by rancher dependency on federal forage. Average dependency of permittees on federal forage is highest in Arizona and lowest in Montana. The difference is due to the amount of federal land compared to private land, the availability of year-long grazing, and the number of permittees who have BLM and Forest Service permits.

Livestock operations with federal permits are on average larger than operations without federal permits. Data from the 1990 Farm Costs and Returns Survey (FCRS), which contains ranch survey information on 6,678 permittees and 49,658 nonpermittees, shows that permit-



tees on the average have more than twice as many cows as nonpermittees, 221 cows versus 93 cows. In addition, permittees average almost nine times as many sheep as nonpermittees, 112 sheep versus 13 sheep.

According to the 1990 Farm Costs and Returns Survey, BLM and Forest Service grazing fee expenses represent about 3 percent of total cash costs. Average per-cow costs for permittees are significantly lower than for nonpermittees. An estimate of the cost differential suggests that nonpermittee net costs are about \$40 per cow higher than permittee costs.

Nonpermittees purchased 10 times more feeder cattle than did permittees. This greater involvement in purchased feeder cattle by nonpermittees would by itself increase per cow costs. But on a per hundred weight basis, permittees costs were \$10 per hundred weight lower than nonpermittee costs, and receipts per hundred weight were slightly higher for permittees.

Permittees spent more per cow for breeding stock, fences, and hired labor than nonpermittees. Nonpermittees spent more per cow overall for capital items, machinery, buildings, equipment, feed, pasture rental, purchased stock cattle, and other variable and fixed cash costs.

## Permit Value

As a general rule, a ranching operation which possesses a grazing permit is worth more than a similarly situated ranching operation that does not possess a grazing permit. The real estate market recognizes the difference in value between the two types of ranching operations in purchases and sales of such property. The difference in value reflects the benefits associated with the federal grazing permit. A long line of court cases has held that ranch owners with grazing permits cannot recover from the United States for losses in ranch value due to modifications of their grazing permit. A contrary result would place the government in the awkward position of being required to compensate ranch owners for privileges that were conferred by the government in the first place. In essence, recognition of permit value would allow permittees to retain the capitalized value of a public resource in their own hands, a resource which has never been conveyed by the public to the permittees.

In theory, the value of a permit at least partially reflects the capitalized difference between the grazing fee and the competitive market rate that could be charged for federal forage. Raising the grazing fee to a competitive market rate could eliminate the "value" of the permit. Altering the permit, such as the length of permit or the number of AUMs authorized, might also have this effect.

## Social Conditions

Many rural areas are experiencing a significant increase in population after decades of stability or decline. Other rural areas continue to lose population due in part to the outmigration of young people who leave for advanced education, military service, and employment. The West also has major cities that have experienced significant growth over the last few decades. These cities have many residents that are concerned about the environment and use the public rangelands for recreational pursuits.

The movement of people and jobs into rural areas began in the 1970s and is expected to continue into the 21st century. In scenic areas, ranches are being sold for recreation uses or subdivided for homes. Western rural areas are moving from a long-term economic dependence on agriculture or mining to recreation and tourism. These trends may cause rural natives to feel that they have lost control of their community.

A survey conducted by Saltiel (1991) provides information on the attitudes of 1,084 Montana farmers and ranchers toward grazing fees. Sixty-seven of the respondents opposed raising grazing fees, and 85 percent said increased grazing fees would harm them. But 56 percent of the ranchers without federal permits favored raising grazing fees. Nearly two-thirds of ranchers without federal permits said that a fee increase would not affect them, while 10 percent said that a fee increase would benefit them. A key point of Saltiel's survey is that most western ranchers do not have federal grazing permits and would not be affected by an increase in grazing fees.

According to data gathered in 1991 from 3,853 ranchers in 11 western states, the average rancher is 55 years old and has worked on the same ranch for more than 31 years. The average



ranching family had ranched in the same state for 68 years.

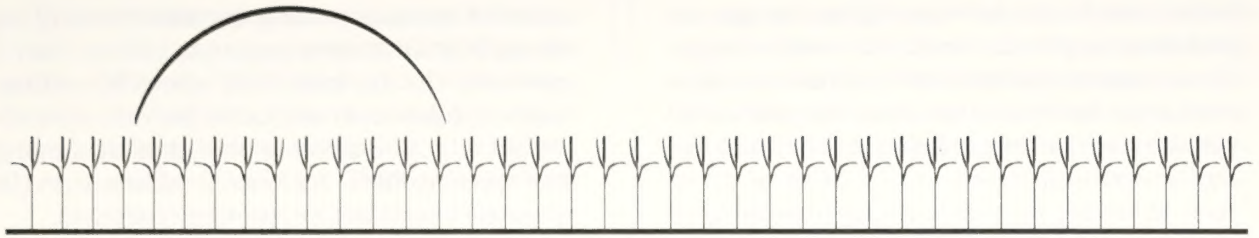
These long-time ranchers perceive themselves as personifying traits such as fair play, honesty, and independence. They take great pride in being independent but neighborly when the need arises. Most ranchers face increasingly stressful social situations as they try to balance their traditional lifestyles with changing communities.

In the past, natural resource management on public lands emphasized commodities. Emerging concerns regarding other non-commodity values have forced a reevaluation of resource management practices. In a 1993 national study of attitudes about rangeland management, two-thirds of the respondents said ranchers should pay more to graze livestock on federal lands. At least three-fourths of the respondents said wildlife should be better protected. About two-fifths said the economic vitality of local communities should be given priority in

decisionmaking about federal rangelands; a similar proportion disagreed.

According to public scoping for this EIS, groups and individuals with environmental concerns believe the current grazing fee system does not account for all costs to public resources, undervalues the grazing privilege, and tends to encourage overemphasis of grazing at the expense of other federal land uses.

Many recreationists want stricter policies on lands that are fragile and damaged. Recreationists who want cattle removed from federal rangeland believe cattle are destructive, their byproducts are disturbing, and fees should cover the damage to federal land. Some recreationists, however, are concerned about ranchers selling to outside interests. Many recreationists depend on ranchers opening their land to recreation and are concerned that new interests will close their land. Others believe ranching can be compatible with other uses, so long as livestock are properly managed.



# EXECUTIVE SUMMARY

## Chapter 4: Environmental Consequences

*Figures S-5 through S-11 at the end of the Executive Summary compare forage, vegetation, and industry income impacts across all alternatives.*

### ***Management Alternative 1: Current Management***

*The continuation of Current Management would cause the following changes in livestock use and environmental conditions.*

#### **Grazing Administration**

##### **Livestock Use Levels**

*Livestock forage authorized by BLM would decline by 18 percent and forage authorized by the Forest Service would decline by 19 percent over 20 years. Contributing factors include stocking rate adjustments resulting from monitoring studies that indicate continuing resource damage and a declining economic feasibility of livestock grazing. Changes in forage authorization would also result from implementation of recovery plans for listed threatened and endangered species.*

*BLM and Forest Service grazing regulations would continue to be inconsistent in the following areas: leasing, prohibited acts, advisory boards, suspended nonuse, unauthorized use, affected interests, appeals process, grant policy, Range*



Betterment Fund use, water rights, foreign corporations, permit size limits, and service charges. These inconsistencies would continue to cause confusion for permittees and the public and would continue to produce inefficiencies that increase administrative costs. In some areas, such as delays in implementing management changes caused by BLM's appeals process, current regulations would continue to be contributing factors for declining environmental conditions.

## Availability and Use of Range Betterment Funds

Current BLM interpretation of Range Betterment Funds does not allow spending funds for tasks such as project planning, environmental assessments, and range improvement monitoring, even though they may be directly associated with on-the-ground improvements. Requiring such costs to be paid with program administration funds reduces the capabilities of those other resource programs. Restricting the use of Range Betterment Funds to a narrow interpretation of what is associated with on-the-ground projects would, however, ensure funding for construction of range improvement projects, but not necessarily their efficient functioning.

Under Current Management the grazing fee would not change and grazing fee receipts would decline by 20 percent over the long term. The corresponding decrease in Range Betterment Funds would limit the building of range improvement projects, decrease reconstruction of existing projects, and slow implementation of allotment management plans. Resource conditions could deteriorate at an accelerated rate, and livestock grazing could need to be reduced more than currently projected.

## Vegetation

### Upland Conditions

In the long term (20 years), it is estimated that about 117 million BLM upland acres would be in proper functioning condition (an increase of 30 percent). Another 22 million upland acres would be functioning but susceptible to degradation (a decrease of 55 percent), and upland

acres in nonfunctioning condition would be about 20 million acres (a decrease of less than 5 percent). In the long term, about 60 million acres (82 percent) of Forest Service uplands would either be meeting objectives or moving towards objectives. Another 13 million acres (18 percent) would not be meeting objectives.

### Riparian Conditions

In the long term, about 33 percent of BLM riparian areas would be functioning properly (a decrease of 3 percent from 1993), 45 percent would be functioning but susceptible to degradation (a decrease of less than 1 percent from 1993), and 21 percent would be nonfunctioning (an increase of 7 percent from 1993). In the long term, about 75 percent of Forest Service riparian areas would either be meeting objectives or moving toward objectives (a decrease of 4 percent from 1993). About 25 percent would not be meeting objectives (an increase of 14 percent from 1993).

The following factors would contribute to these projected vegetation changes:

- Uplands would improve over the long term because the historical management emphasis and the use of Range Betterment Funds have favored pasture configurations and rangeland developments intended to benefit upland vegetation.
- Uplands would gradually improve because, once depleted, arid lands change very slowly. Upland areas that receive more than 12 inches of annual precipitation would be most likely to improve. Uplands that receive less precipitation would not change significantly. Areas dominated by thick stands of woody vegetation, such as juniper, are unlikely to change without mechanical treatment or fire.
- Riparian conditions would decline mainly because of the tendency for livestock to congregate in and overgraze low-elevation riparian areas. Local management plans are inconsistent and vary in effectiveness. Local improvements would be made but would not reverse the broad, long-term decline in riparian resources.



- Existing administrative procedures tend to hinder improvements in riparian conditions. Permittees often view changes to improve riparian areas as costly or disruptive to traditional grazing patterns. Appealed BLM decisions are stayed by the existing administrative process, and needed management changes are substantially delayed.

## Watershed

Watershed and water quality conditions would remain static or decline slightly over the long term. Accelerated erosion and runoff from uplands would decrease, but streambank trampling by livestock and continued decline in overall riparian conditions would increase sediment discharge in many areas. Over the long term important watershed functions, such as water quality maintenance, flood peak reduction, and ground water recharge, would remain nonfunctioning or functioning but susceptible to degradation.

## Wildlife

Improvements in upland vegetation would benefit upland-dependent wildlife. Big game species would remain generally stable. Local populations would be affected primarily by habitat changes caused by fire, and by climatic conditions. However, the decline in riparian conditions would affect big game species, such as mule deer, that rely on riparian habitats for thermal and hiding cover.

The abundance and diversity of wildlife species dependent on riparian habitat would decline over the long term. At greatest risk would be waterfowl, many upland game birds, and raptors associated with cottonwood and aspen riparian habitats.

About 20 percent of anadromous fish habitat would significantly improve, but habitat conditions elsewhere would remain static or decline. Overall, anadromous fish populations would continue to decrease over the long term.

## Special Status Species

Special status species associated with upland vegetation would benefit from improvements

in upland conditions. But, many special status species are associated with riparian habitat. Their status would be unlikely to change and as riparian areas continue to decline, more species dependent on these areas would become listed.

## Wild Horses and Burros

Improvements in upland vegetation would benefit wild horses and burros. Herds, however, would continue to be harmed by administrative procedures that favor livestock benefits over other uses, such as spending Rangeland Betterment Funds to build livestock fences within herd management areas.

## Recreation, Wilderness, and Cultural Resources

Recreation values would continue to be degraded by livestock grazing and by declines in water quality and riparian habitat conditions. Livestock trampling and fecal matter reduce aesthetics and environmental quality at developed and undeveloped recreation sites. Declining riparian conditions reduce wildlife viewing opportunities, make streams less floatable and fishable, and degrade a variety of recreation experiences.

Continued declines in riparian conditions and concentrations of livestock in riparian areas would lessen naturalness, solitude, and other values of designated wilderness and wilderness study areas.

Cultural resources are often associated with riparian areas and would continue to be harmed by livestock trampling and accelerated erosion in nonfunctioning riparian habitats. Overgrazing also reduces native food-source plants important to Native Americans.

## Economic Conditions

Allocated forage would decline on average by 5 percent over 5 years and by 20 percent over 20 years. These declines are based on trends over the past 10 years, which are projected to continue. Contributing factors include stocking rate adjustments resulting from monitoring studies that indicate continuing resource damage and a declining economic feasibility of live-



stock grazing. Changes in forage authorization would also result from implementation of recovery plans for listed threatened and endangered species.

Employment and income impacts would be minor in the agriculture sector in particular and compared to the westwide economy as a whole. The economic impacts would occur in the context of a western economy that has shown consistent growth over the past 10 years and is expected to continue growing. Continued growth in employment and income in other sectors would tend to offset the relatively small employment and income reductions from declines in livestock AUMs.

Population growth and demographic changes in the West and in many western rural communities would continue to transform rural economies. Population growth in many rural communities, while contributing to economic growth and diversification, would continue to diminish the relative importance of agriculture in those communities.

## Social Conditions

Permittees would have time to adjust to the projected long-term decline in forage. Income would decline if fee levels increase unless offset by increases in livestock prices and off-ranch income. Losses in ranch income would result in declines in the economic well-being of some permittees and their families. Lifestyle changes could include families decreasing their spending, diversifying operations to make them less dependent upon ranching, sending family members to work off the ranch to bring in more income. Most permittees would try to adjust their operations rather than sell their ranches because they value the ranching lifestyle.

Because permittees and other county residents would have time to adjust to the long-term declines in federal forage, and because Current Management represents no change from current policy, the social environments of many communities would not be affected.

Generally, the social well-being of recreationists and environmentalists would decline under Current Management because of the projected long-term decline in riparian and wildlife habitat and recreation opportunities.

## Management Alternative 2: BLM - Forest Service Proposed Action

Implementing the Proposed Action would cause the following changes in livestock use and environmental conditions.

### Grazing Administration

#### Livestock Use Levels

After 20 years, authorized livestock forage would be 3 percent less than under current management. Contributing factors include stocking rate adjustments resulting from monitoring studies that indicate continuing resource damage and a declining economic feasibility of livestock grazing. Changes in forage authorization would also result from implementation of BLM state or regional standards and guidelines and recovery plans for listed threatened and endangered species. Livestock forage authorized by the Forest Service would be the same as under current management.

The Proposed Action would also have the following effects:

- BLM and Forest Service grazing regulations would become consistent in most areas. Agency regulations would remain different in leasing, suspended nonuse, incentive fee criteria, and advisory groups. Overall, grazing administration would become less confusing to the public and would increase in efficiency. Permittees with both Forest Service and BLM permits would be subject to more consistent grazing policies. Contiguous Forest Service and BLM permittees could be managed with increased consistency.
- Regulation changes to exempt small, unintentional trespass from formal procedures and establish a 3-year minimum requirement for base property leases would decrease BLM administrative workloads and costs.



- BLM's workload would increase initially during the development of state or regional standards and guidelines.
- Multiple resource advisory councils would provide more balanced input to BLM's rangeland management decisionmaking process than the current Grazing Advisory Boards. Continued open public involvement in the Forest Service decision process would not exclude anyone.
- The changes would allow both agencies to implement ecosystem management practices more consistently.

## Availability and Use of Rangeland Betterment Funds

The Rangeland Betterment Funds available would depend on the grazing fee formula selected for implementation. Funds available would decline by 21 percent if the grazing fee remains constant, and would increase by 82 percent if the BLM-Forest Service proposed grazing fee formula is adopted.

As under the Current Management alternative, a decrease in Range Betterment Funds would limit construction of range improvement projects, decrease maintenance of existing projects, and slow implementation of allotment management plans. Resource conditions could deteriorate at an accelerated rate and livestock grazing may need to be reduced more than currently projected. An increase in Rangeland Betterment Funds would enhance the agencies' abilities to plan, and invest in range improvement projects to achieve resource objectives.

## Vegetation

### Upland Conditions

In the long term, BLM upland acres in proper functioning condition would be about 138 million acres, an increase of 55 percent (as compared to a 30 percent increase under Current Management). Upland acres functioning but susceptible to degradation would be about 6 million acres, a decrease of almost 90 percent (a 55 percent decrease is expected under Current Man-

agement). Upland acres in nonfunctioning condition would be about 15 million acres, a decrease of 30 percent (less than 5 percent decrease is expected under Current Management). In the long term, about 60 million acres (82 percent) of Forest Service uplands would either be meeting objectives or moving towards objectives (an increase of 2 percent). Another 13 million acres (18 percent) would not be meeting objectives (a decrease of 9 percent).

### Riparian Conditions

In the long term, about 43 percent of BLM riparian areas would be properly functioning (an increase of 27 percent from 1993). In contrast, under Current Management proper functioning riparian areas would decrease by 3 percent. About 41 percent would be functioning but susceptible to degradation (a decrease of 11 percent from 1993), and 16 percent would be nonfunctioning (a decrease of 20 percent from 1993). In contrast, riparian areas under Current Management in nonfunctioning condition would increase by 7 percent. In the long term, about 84 percent of Forest Service riparian areas would either be meeting objectives or moving toward objectives (an increase of 7 percent from 1993). About 16 percent would not be meeting objectives (a decrease of 26 percent from 1993).

The following factors would contribute to these projected vegetation changes:

- BLM national requirements would require management changes by the next grazing season in upland and riparian areas that are in nonfunctioning condition.
- Riparian areas respond quickly to changes in grazing management. Implementing standards and guidelines would immediately benefit inventoried riparian areas in nonfunctioning condition.
- Ending the automatic stay of appealed BLM decisions (making the rule consistent with that applied to most BLM appeals) would allow most decisions to take effect within 75 days and enable BLM to more rapidly make management



changes needed to achieve resource objectives.

- Resource conditions would benefit greatly from certain administrative changes, such as providing for conservation use, allocating 50 percent of BLM Range Betterment Funds to priority areas, and allowing the use of Range Betterment Funds for planning and monitoring the effectiveness of range improvement projects.

## Watershed

The Proposed Action would substantially improve upland watershed conditions over the long term. Reduced forage consumed by livestock would increase plant cover and water infiltration, resulting in less runoff and erosion. Riparian watershed conditions would benefit moderately from improved management and reduced livestock use. Water quality, ground water recharge, and increased streamflow would improve or increase on the 20 percent of the inventoried nonfunctional riparian areas projected to improve.

## Wildlife

The overall improvements in vegetation and watershed conditions would benefit most wildlife species. Projected increases in upland grasses would favor such big game species as elk over antelope and mule deer, but habitat diversity would be maintained on a local basis through management treatments and natural events such as wildfire and drought.

Increases in functioning riparian habitat would improve food sources, nesting, brood-rearing, and thermal cover for most wildlife. Big game, nongame, upland birds, waterfowl, raptors, and anadromous and resident fisheries would benefit over the long term. BLM control of future water rights on public lands and ownership of future permanent range improvement projects would also increase management opportunities for wildlife.

## Special Status Species

Over the long term, the Proposed Action would improve the vegetation communities fa-

vored by most special status species. Special status species dependent on native upland vegetation, such as sage grouse, could benefit substantially from the projected changes in upland condition. Improvements in riparian conditions would benefit populations of aquatic special status species such as the Lahontan cutthroat trout, Gila trout, and others.

## Wild Horses and Burros

Improvements in riparian and watershed conditions would improve the overall health of herd management areas over the long term. Multiple resource advisory councils would give the needs of wild horses and burros more balanced consideration in range improvement projects and other management issues. Management opportunities for wild horses and burros would also increase due to cooperative agreements for BLM control of future water developments, BLM asserting claims to water under state law on public lands for grazing purposes on such lands, and BLM ownership of future range improvement projects.

## Recreation, Wilderness, and Cultural Resources

Improved habitat conditions would benefit overall recreation experiences. Fishing, boating, swimming, and wildlife viewing would improve as water quality and riparian conditions recover. Objectionable conditions, such as the presence of fecal matter, increased insects, and streambank erosion, would moderately decline over the long term.

Projected habitat improvements would benefit the naturalness of wilderness and wilderness study areas. Yet continued livestock and range development projects could continue to lessen opportunities for solitude and primitive and unconfined recreation.

Revising BLM livestock grazing regulations to allow cancellation of permits for violations of the Archaeological Resources Protection Act and the Native American Graves Protection and Repatriation Act would give cultural resources added protection. Cultural resources would also benefit from the requirement to locate livestock management facilities outside riparian areas, where a high density of cultural resources tends to occur.



## Economic Conditions

Allocated forage would be 3 percent less than under current management after 20 years. These declines are based both on trends over the past 10 years, which are projected to continue, and on management actions specific to the Proposed Action, which would reduce allocated forage in the short term. For example, authorized forage under Current Management would decline by 15 percent in 5 years, and 18 percent in 20 years. In the long term, forage reduction under the Proposed Action and Current Management would be virtually the same.

Consequently, impacts on employment and income would be greater under the Proposed Action in the short term, but over the long term would be similar to continuation of Current Management. Ranch employment and income could continue to decline in a western economy that has consistently grown over the past 10 years and is expected to continue growing. Continued growth in employment and income in other sectors would overshadow the relatively small employment and income reductions from declines in livestock grazing on federal lands.

Local impacts might or might not exceed overall impacts. Location and intensity of impacts are difficult to estimate. Ranching operations with a large number of cows and a large dependency on federal forage would be affected the most.

Improvements in resource conditions under the Proposed Action would create some positive economic impacts in the long term and offset some of the declines in employment and income from reduced forage allocations. Improved wildlife habitat and recreation sites could increase employment and income as hunting, fishing, and wildlife viewing opportunities increase.

Employment and income impacts would be minor relative to current conditions and trends in the westwide economy as a whole and in the agriculture sector in particular. The economic impacts would occur in the context of a western economy that has shown consistent growth over the past 10 years and is expected to continue growing. Thus, continued growth in employment and income in other sectors would tend to overshadow the relatively small employment and income reductions from declines in livestock AUMs on public lands.

## Social Conditions

While the Proposed Action would move toward greater equity among fees, it would still result in a fee below the fees charged for grazing on state lands in most western states, and would fall well below private grazing land lease rates. The amount by which the fee would increase is similar to recent increases that have taken place at the state level; those increases have not led to noticeable shifts in the livestock industry or economic effects on communities in those states. This, when considered with the reasonableness of the proposed fee increase and the fact that more than 73 percent of BLM permittees and lessees would experience a fee increase of less than \$1,000 per year, offers evidence that the proposed change in the fee would generally not have a significant impact on the stability of the dependent western livestock industry and would not have a serious detrimental effect on most permittees and lessees.

Some permittees and lessees that are highly dependent on federal forage, do not have off-ranch income, and have heavy debt loads may be required to make some financial adjustments. These adjustments, in some circumstances, may include sale of the ranch; however, it is expected that such sales would occur in limited circumstances. Such sales, it should be noted, are occurring and will continue to take place under current conditions, as well.

The economic impact on western communities is expected to be localized and, in most areas, not significant because that portion of the local economy that depends upon the use of federal forage is relatively minor.

Changes in regulations might also require permittees to more intensively manage their operations. Ranchers are concerned about forage reductions that would result from implementing BLM standards and guidelines, the broadened representation on advisory boards and councils, and BLM ownership of all future permanent range improvements. However, multiple resource advisory councils would provide a forum for consensus building.

The Proposed Action, particularly at higher fee levels, would intensify feelings of mistrust and loss of personal control. However, multiple resource advisory councils would return some of the control back to public land users of all



types. Improved range conditions could also enhance the long term stability of the ranching industry.

Generally, the social well-being of recreationists and environmentalists would improve under the Proposed Action because of improved riparian and wildlife habitat. This alternative is consistent with the attitudes of increased numbers of people in the West and across the country who believe that rangeland management should emphasize the protection of rangeland resources.

Job losses at all fee levels would be insignificant on a westwide basis. Most of the projected decline in employment would be absorbed through retirements and people seeking other types of work in the normal course of their lives.

### ***Management Alternative 3: Livestock Production***

Implementing the Livestock Production alternative would cause the following changes in livestock forage use and environmental conditions.

#### **Grazing Administration**

##### **Livestock Use Levels**

Based on current trends, forage grazed would decline by 4 percent in the short term. For the long term, vegetation manipulation and range improvements would somewhat offset these trends, but forage would decline by 10 percent for BLM and 14 percent for the Forest Service, as compared to 15 percent in 5 years and 18 percent in 20 years under Current Management. After 20 years, livestock forage would be 4 percent greater under this alternative than under Current Management.

Changes in grazing regulations relating to standards and guidelines, nonuse, grazing advisory boards, range improvement ownership and water rights would allow BLM and the Forest Service to more efficiently administer their rangeland programs. The Livestock Production alternative would also have the following impacts:

- Authorizing grazing advisory boards to determine the validity of leases would lessen agency administrative workloads.
- Issuing 20-year permits to good stewards would reduce the administrative workload of reissuing permits.
- Allowing nonmonetary settlements for incidental unauthorized use would improve the efficiency of BLM employees.
- Tracking and maintaining records of suspended nonuse would continue to create administrative inefficiency.
- Requiring the Forest Service to work with grazing advisory boards in setting priorities for the use of Range Betterment Funds would add to the Forest Service workload.
- Transferring administrative roles to grazing advisory boards would save time and money for the agencies.

#### **Availability and Use of Range Betterment Funds**

Range Betterment Fund amounts would depend on the grazing fee formula selected for implementation. Due to the projected decline in livestock use, if the current grazing fee formula is retained, Range Betterment Funds would decline by 12 percent. A 12 percent decrease in Range Betterment Funds, coupled with rising costs for range improvements, would allow fewer range improvements in the future.

Under the BLM-Forest Service proposed grazing fee, or regional fees, Range Betterment Funds would increase by 102 percent or 202 percent, respectively. Such large increases in Range Betterment Funds would more than offset rising costs of range improvements.

The net result of higher funding levels over the long term would be a substantial increase in the agencies' abilities to implement, maintain and rebuild range improvements aimed at a relatively narrow range of resource management objectives.



## Vegetation

### Upland Conditions

In the long term, about 129 million BLM upland acres would be in proper functioning condition (an increase of 40 percent), 12.5 million upland acres would be functioning but susceptible to degradation (a decrease of 75 percent), and 17.5 million upland acres would be in nonfunctioning condition (a decrease of 15 percent). In the long term, about 60 million acres of Forest Service uplands would either be meeting objectives or moving towards objectives (an increase of 2 percent); another 13 million acres would not be meeting objectives (a decrease of 9 percent).

### Riparian Conditions

In the long term, about 32 percent of BLM riparian areas would be properly functioning (a decrease of 8 percent from 1993). Another 45 percent would become functioning but susceptible to degradation (a decrease of 2 percent from 1993). About 24 percent would be nonfunctioning (an increase of 18 percent from 1993). In the long term, about 70 percent of Forest Service riparian areas would either be meeting objectives or moving towards objectives (a decrease of 10 percent from 1993); another 30 percent would not be meeting objectives (an increase of 37 percent from 1993).

The following factors would contribute to these projected vegetation changes:

- Standards and guidelines developed regionally by grazing advisory boards would likely emphasize the needs of livestock permittees. These needs include upland watershed stability and quality livestock forage conditions. This emphasis would help improve upland vegetation, but, combined with sustained grazing levels, would contribute to riparian area decline.
- Many grazing advisory boards would not support difficult decisions to better manage livestock for riparian protection.

- Livestock congregating near water and continuing to graze at current levels would result in overuse of riparian areas.
- The Livestock Production alternative would consider the management of sustainable diversified ecosystems to be secondary to the socioeconomics of western livestock production.

## Watershed

Watershed and water quality conditions would decline over the long term. Improvement in upland vegetation over the long term would reduce runoff and erosion, but continued grazing near riparian areas would more than offset this improvement. Continued grazing in riparian areas would cause increased sediment, altered stream channel structure, warmer water temperatures, lower dissolved oxygen levels, and continued nonpoint-source pollution at or near existing levels.

## Wildlife

The decline of riparian areas would contribute to the long-term decline in riparian-dependent wildlife. Big game species, such as antelope and mule deer, rely on riparian habitat for shade and cover. The overall decline in riparian vegetation condition would reduce water, nesting habitat, roosting habitat, forage, and cover for upland game, waterfowl, and raptors. Overall aquatic habitat for resident and anadromous fish would continue to decrease as riparian conditions decline.

## Special Status Species

As riparian areas declined, special status species dependent on riparian habitat would decrease and become listed at an accelerated rate. Upland species dependent on livestock forage may increase slightly over the long term due to improved upland conditions.

## Wild Horses and Burros

Improved upland vegetation conditions would increase the amount of forage for wild



horses and burros. More range improvements, such as water projects, developed to increase livestock production would also benefit wild horses and burros. But spending Range Betterment Funds to build fences would constrain herd movements.

## Recreation, Wilderness, and Cultural Resources

Recreation experiences would decline more significantly under Livestock Production than under the Current Management because of increased range improvements, fencing and a decline in riparian conditions. More range improvements would lower the quality of user experiences. The expected increase in fencing would interfere with all types of travel. Declining riparian conditions would reduce wildlife viewing opportunities, make streams less floatable and fishable, and worsen a variety of recreation experiences.

In the long term, wilderness study areas not designated wilderness would be subject to loss of wilderness values by new range improvements.

Livestock trampling and the effects of erosion in nonfunctioning riparian habitats would harm cultural resource often associated with riparian areas. An increase in livestock management facilities and major revegetation projects under the Livestock Production alternative could disturb extensive areas, directly damaging cultural resources.

## Economic Conditions

Allocated forage would decline by 3 percent after 5 years and by 12 percent after 20 years. The Livestock Production alternative would result in the lowest decline in allocated forage of all alternatives because of the increased management emphasis on producing livestock forage.

Fewer employment and income impacts would result from the Livestock Production alternative than from other alternatives. The impacts would be slight in the agriculture sector in particular and compared to the westwide economy as a whole. Continued growth in employment and income would tend to offset the

relatively small employment and income declines from reduced forage. Short- and long-term rates of decline in employment and income would be lower than the rates of decline under Current Management but would not be reversed.

Increased emphasis on producing livestock forage would slightly slow the decline in the livestock subsector of the agriculture industry. But population growth and demographic changes in the West and in many western rural communities would continue to transform rural economies.

The overall projected deterioration of resource conditions would lessen recreation opportunities, which could adversely affect recreation-related economic activity.

## Social Conditions

Losses in income under Livestock Production would be smaller than under Current Management. Permittees would have time to adjust to long-term declines in forage. At higher fee levels, losses would be higher than permittees are now experiencing.

Permittees would feel somewhat more in control over the management of their ranches under the Livestock Production alternative. However, demographic changes throughout the West would continue in a manner that could be threatening to the lifestyle values of some permittees. In some areas, recreationists and environmentalists might feel that more should be done to protect recreation, riparian, and wildlife resources.

Increasing numbers of people in the West and across the country believe that rangeland management should emphasize protecting resources rather than managing livestock. The Livestock Production alternative generally opposes these attitudes.

## *Management Alternative 4: Environmental Enhancement*

Implementation of the Environmental Enhancement alternative would cause the following changes in livestock forage use and environmental conditions.



## Grazing Administration

### Livestock Use Levels

In the short term, authorized livestock forage would decline from existing forage consumption by 53 percent on BLM public lands (as compared to 15 percent under Current Management) and by 45 percent on National Forest system lands. In the long term, authorized livestock forage would decline by 30 percent on BLM public lands (as compared to 18 percent under Current Management) and by 29 percent on Forest Service administered land. After 20 years, livestock forage would be 12 percent less than under Current Management. Contributing factors include stocking rate adjustments resulting from monitoring studies that indicate continuing resource damage and a declining economic feasibility of livestock grazing. Changes in forage authorization would also result from implementation of recovery plans for listed threatened and endangered species.

The projected decline reflects of the limits on grazing under the Environmental Enhancement alternative. This alternative would also have the impacts listed below:

- BLM and Forest Service regulations would be consistent.
- Changes in BLM grazing regulations and policies for lease and agreements, unauthorized use, full force and effect decisions, disqualification, resource advisory boards, range improvement ownership and permit size limits would improve BLM's efficiency. The Forest Service would improve its ability to deter unauthorized use and reduce the number of grazing permits issued. The changes would allow both agencies to implement ecosystem management practices.
- BLM's workload would increase initially as BLM develops and implements regional standards and guidelines.
- Measuring compliance to determine length of permit tenure would initially increase administrative duties, but ad-

ministrative work would level off over the long term as management improves.

- Resource advisory councils would provide more balanced input into the decision process for both agencies, resulting in more informed decisions.
- The opportunity for the public to petition to close areas to livestock grazing or to reopen closed areas would increase the workload for both agencies.
- The loss in ownership of range improvements would make some permittees less likely to contribute to future BLM range improvement projects. But, as the new policy becomes more accepted over time, permittee investment would rise again to the current level of the Forest Service.

### Availability and Use of Range Betterment Funds

Range Betterment Fund amounts would depend on the grazing fee formula selected for implementation. A decline in livestock use would decrease Range Betterment Funds if the current grazing fee formula is retained. A decrease in Range Betterment Funds, coupled with rising costs for range improvements, would allow fewer range improvements in the future. While some range improvements would no longer be needed, others would continue to be needed to meet livestock management and other resource objectives. A decline in funding would be somewhat offset by giving the agencies more flexibility to distribute funds to priority areas.

With the proposed grazing fee formula or regional fees, Range Betterment Funds would increase. Such increases would more than offset the rising costs of range improvements and would allow more range improvements to be built, maintained, and rebuilt.

### Vegetation

#### Upland Conditions

In the long term, about 151 million acres (95 percent) of BLM uplands would be in proper



functioning condition (an increase of about 65 percent); BLM upland acres would be functioning but no susceptible to degradation; and about 8 million upland acres (5 percent) would be in nonfunctioning condition (a decrease of about 60 percent). In the long term, about 69 million acres (95 percent) of Forest Service uplands would either be meeting objectives or moving towards objectives (an increase of 18 percent); another 3.8 million acres (5 percent) would not be meeting objectives (a decrease of 73 percent).

## Riparian Conditions

In the long term, about 59 percent of BLM riparian areas would be properly functioning (an increase of 71 percent from 1993). Another 32 percent would become functioning but susceptible to degradation (a decrease of 30 percent from 1993). About 9 percent would be nonfunctioning (an increase of 53 percent from 1993). In the long-term, 100 percent of Forest Service riparian areas would either be meeting objectives or moving towards objectives (an increase of 28 percent from 1993).

The following factors would contribute to these projected vegetation changes:

- Implementing standards and guidelines that would allow grazing only in areas in proper functioning condition and would remove livestock from critical or unsuitable areas.
- Riparian areas would improve faster rate uplands because of the greater productive potential of riparian areas.
- Ending the automatic stay of appealed BLM decisions would allow most decisions to take effect within 75 days and enable BLM to make management changes needed to achieve resource objectives.
- Fifty percent of the Range Betterment Funds would be allocated on the basis of ecosystem needs and would be used to improve or stabilize priority areas.

## Watershed

Watershed and water quality would improve significantly in the long term, partially from

grazing practices, but mainly from removing livestock from areas not in proper functioning condition. Erosion and runoff would not change in the short term because at least 3 years would be needed to inventory, classify and remove livestock from uplands deemed unsuitable for grazing. Improved riparian and upland conditions would complement each other. Pollutants from grazing practices would diminish as grazing is reduced.

## Wildlife

Improved upland and riparian vegetation would increase cover for many wildlife species. Such improvements would benefit big game, upland game, waterfowl, raptors and fish by providing more diverse, healthy ecosystems. Such ecosystems provide more habitat and diverse diets for all wildlife. Resting riparian/aquatic habitats from grazing is the most compatible grazing strategy for fish habitat.

## Special Status Species

Special status species would trend toward recovery in the short and long term as upland vegetation and riparian areas improve and provide the habitat characteristics required by many of these species.

## Wild Horses and Burros

Improvement of upland and riparian vegetation would improve habitat conditions for wild horses and burros. By filing for all water rights under state law for new grazing related water developments, BLM would maintain the water sources year round for a variety of multiple uses, including wild horses. The free-roaming nature of wild horses would be considered when determining the location and construction of livestock fences.

## Recreation, Wilderness, and Cultural Resources

The closing of developed recreation sites to livestock grazing would eliminate livestock impacts to facilities. By removing livestock and range improvement projects from many areas, scenic quality would improve. The increase in



wildlife would provide more opportunities for hunting, fishing, and observing wildlife. Improved riparian habitat would provide more floatable and fishable rivers and streams.

The naturalness, solitude, and other values of wilderness and BLM- and Forest Service-recommended wilderness would improve with the removal of livestock and improvements in riparian condition.

In the areas where livestock are removed, impacts to cultural and paleontological resources would be eliminated. The improvement of riparian resources to proper functioning condition would reduce the effects of erosion on cultural resources. Building fewer range improvements would reduce the potential for disturbances to cultural resources.

## Economic Conditions

Allocated forage would decline by 50 percent overall after 5 years and by 30 percent overall after 20 years. These declines are based both on trends over the past 10 years, which are projected to continue, and management actions expected to reduce allocated forage significantly in the short term.

The 5-year declines in employment and income across all fee levels would amount to 0.5 percent of total westwide agricultural employment. Employment and income impacts would be greater under the Environmental Enhancement alternative in both the short term and long term than under all the other alternatives except for No Grazing. Still, the impacts would be minor in the agriculture sector in particular and compared to current economic conditions and trends in the westwide economy as a whole. Continued growth in employment and income in other sectors would overshadow the relatively small employment and income reductions from declines in federal forage grazed by livestock. Locally substantial impacts in some rural communities would result.

Improved resource conditions in the long term would create positive economic impacts. These impacts would be greater than under any other alternative, except for No Grazing. Greatly improved wildlife habitat and recreation site improvements could generate increases in employment and income as hunting, fishing, and wildlife viewing opportunities increase.

Increases in Range Betterment Funds resulting from higher grazing fees under several fee alternatives might help mitigate losses to ranches by funding more improvements that benefit livestock.

Population growth and demographic changes in the West and in many western rural communities would continue to transform rural economies. Population growth in many rural communities, while contributing to economic growth and diversification, would continue to diminish the relative importance of agriculture in those communities.

## Social Conditions

Losses in ranch income would result in declines in the economic well-being of some permittees and their families. Lifestyle changes would include families decreasing their spending, diversifying operations to make them less dependent upon ranching, sending family members to work off the ranch to bring in more income, and selling ranches, either to other ranchers or to developers. Most permittees would try to adjust their operations to absorb the income losses rather than sell their ranches because they value their lifestyle. But under Environmental Enhancement, particularly at the higher fee levels, some ranches could no longer stay in business, although it is anticipated that the demand for available AUMs would continue.

Social impacts to permittees, ranching families, ranch employees, and related businesses would be far reaching and would have serious social consequences. For many residents of the ranching community, the Environmental Enhancement alternative, particularly at higher fee levels, would intensify feelings of mistrust and loss of personal control and threaten lifestyles. Some permittees would close off their base property and access they control to public land to exert some control over their lives.

For the typical small community, the Environmental Enhancement alternative at any fee level would accelerate ongoing population losses. The effects of the fee increases would be greatest in areas with a high average dependency on federal forage.

In most communities, residents believe that ranching is an important part of their community and lifestyle. Environmental Enhancement



would indirectly but significantly affect local businesses, particularly agricultural supply and retail stores. Residents would be highly concerned about the change in emphasis away from livestock management and would strongly resent any alternative that greatly reduced livestock grazing on public lands. In some places, this alternative might speed up the ongoing rural development trends where area ranches are purchased and subdivided. Immigrants, developers, and other ranchers might compete over buying the smaller ranches, raising prices. These high prices would make it difficult for the remaining ranchers to purchase much of the land for sale.

Some recreationists and many people and groups with environmental concerns would believe that the Environmental Enhancement alternative offers a proper balance between livestock grazing interests and protecting public natural resources.

## ***Management Alternative 5: No Grazing***

The No Grazing alternative would cause the following changes in livestock use and environmental conditions.

### **Grazing Administration**

#### **Livestock Use Levels**

No permanent livestock forage would be allocated. Livestock would graze only where needed to help achieve resource objectives. Livestock management work in the BLM and Forest Service would decline. Permittees would be compensated for the current value of their investments in livestock improvements, which would be expensive in the short term.

#### **Availability and Use of Range Betterment Funds**

Grazing receipts and Range Betterment Funds would fall to zero. The agencies would rely on appropriations to build or maintain such range improvements needed to meet management objectives. Enforcement costs associated

with unauthorized use supervision would likely rise.

## **Vegetation**

### **Upland Conditions**

In the long term, 151 million acres (95 percent) of BLM uplands would be in proper functioning condition (an increase of about 65 percent), no BLM acres would be functioning but susceptible to degradation, and about 8 million acres (5 percent) would be nonfunctioning (a decrease of about 60 percent). In the long term, 69 million acres of Forest Service uplands would either be meeting objectives or moving toward objectives (an increase of 18 percent), and 3.8 million acres would not be meeting objectives (a decrease of 73 percent).

### **Riparian Conditions**

In the long term, about 65 percent of BLM riparian areas would be properly functioning (an increase of 91 percent from 1993), 28 percent would be functioning but susceptible to degradation (a decrease of 38 percent from 1993), and 6 percent would be nonfunctioning (a decrease of 68 percent from 1993). In the long term, about 100 percent of Forest Service riparian areas would either be meeting objectives or moving toward objectives (an increase of 28 percent from 1993).

Ecological conditions would improve the most under No Grazing. Removing livestock would improve plant vigor and reproduction, increase palatable grasses and forbs, increase plant litter, and reduce bare soil in most upland areas. However, removing livestock would reduce the long-term vigor of grass species in the plains grasslands, which evolved under heavy grazing by bison. Riparian areas would improve because they have high productive potential and respond rapidly to the removal of livestock. The amount, vigor, and diversity of vegetation would greatly increase. Historical riparian areas would be restored where a potential for recovery still exists.



## Watershed

Watershed and water quality conditions would improve to their maximum potential. Increases in upland vegetation and plant litter would improve soil properties, increase water infiltration, and reduce the amount of runoff and erosion from upland areas. Water quality, ground water recharge, flood peak reduction, and other riparian watershed benefits would substantially increase as essentially all riparian areas move towards proper functioning condition.

## Wildlife

The projected improvements in vegetation and watershed conditions would increase the diversity and abundance of wildlife. About 75 percent of degraded anadromous fish habitat would be restored. Waterfowl populations would increase, although expected increases may be limited by changes in resource conditions on private lands. Upland game and nongame species would benefit from improved riparian habitat and from increased vegetation for winter food and cover. The use of management tools such as fire would need to increase to maintain optimal habitat for certain big game species.

## Special Status Species

The broad, accelerated improvement in ecological conditions would result in long-term trends toward the recovery of many listed and sensitive species.

## Wild Horses and Burros

Wild horses and burros would benefit from improvements in vegetation and the removal of developments that restrict herd movement and migration.

## Recreation, Wilderness, and Cultural Resources

Many recreation values and experiences would significantly improve, including scenic

quality, wildlife viewing, hunting, and fishing. Improved riparian areas would extend seasons and increase the number and quality of opportunities for water-based recreation. All recreation sites would be protected from grazing conflicts and impacts. Opportunities for unrestricted movement would increase as fences are removed.

Improved ecological conditions would benefit all wilderness values.

Impacts to cultural resources from development projects and livestock trampling would be eliminated. Historical properties associated with ranching would not be maintained and would be lost in the long term.

## Economic Conditions

The economic impacts would be greatest under the No Grazing alternative. Livestock grazing would be phased out on public lands over a 3-year period, thus reducing the forage for livestock grazing to zero.

No Grazing would affect about 8 percent of the beef cattle inventory in the 11 western states, and 2.4 percent of the beef cattle inventory in the 17 (including Texas) western states, and 0.8 percent of the sheep inventory in the 11 western states.

Employment and income impacts would be minor relative to the total westwide economy. In agriculture, impacts would be relatively greater. But, in the long term, continued growth of employment and income in other industries would tend to offset employment and income reductions from eliminating grazing on public lands.

The effect on beef prices of eliminating livestock grazing on public lands would be slight. In the near term, liquidating sheep and cattle herds, would lower prices as more livestock are slaughtered. In the long term, a 1 percent decrease in national cattle inventory could result in about a 1 percent increase in retail beef prices. But this price effect could be negated by an increase in the national cattle inventory.

Greatly improved wildlife and fisheries habitat and recreation site improvements could increase employment and income as hunting, fishing, and wildlife viewing opportunities increase.



## Social Conditions

Losses in income would be greatest under the No Grazing alternative. These losses in ranch income would result in declines in the economic well-being of many permittees and their families. Lifestyle changes would include families decreasing their spending, diversifying operations to make them less dependent upon ranching, sending family members to work off the ranch to bring in more income, and selling ranches, either to other ranchers or to developers. Most permittees would try to adjust their operations to absorb the income losses rather than sell their ranches because maintaining the ranching lifestyle is important to them. But, under No Grazing, some operations would go out of business.

Owners of land adjoining federal lands would be responsible for preventing the unauthorized use of these federal lands. The agencies would not pay any costs for needed fencing. There would be increased costs for federal land management agencies in controlling livestock trespass.

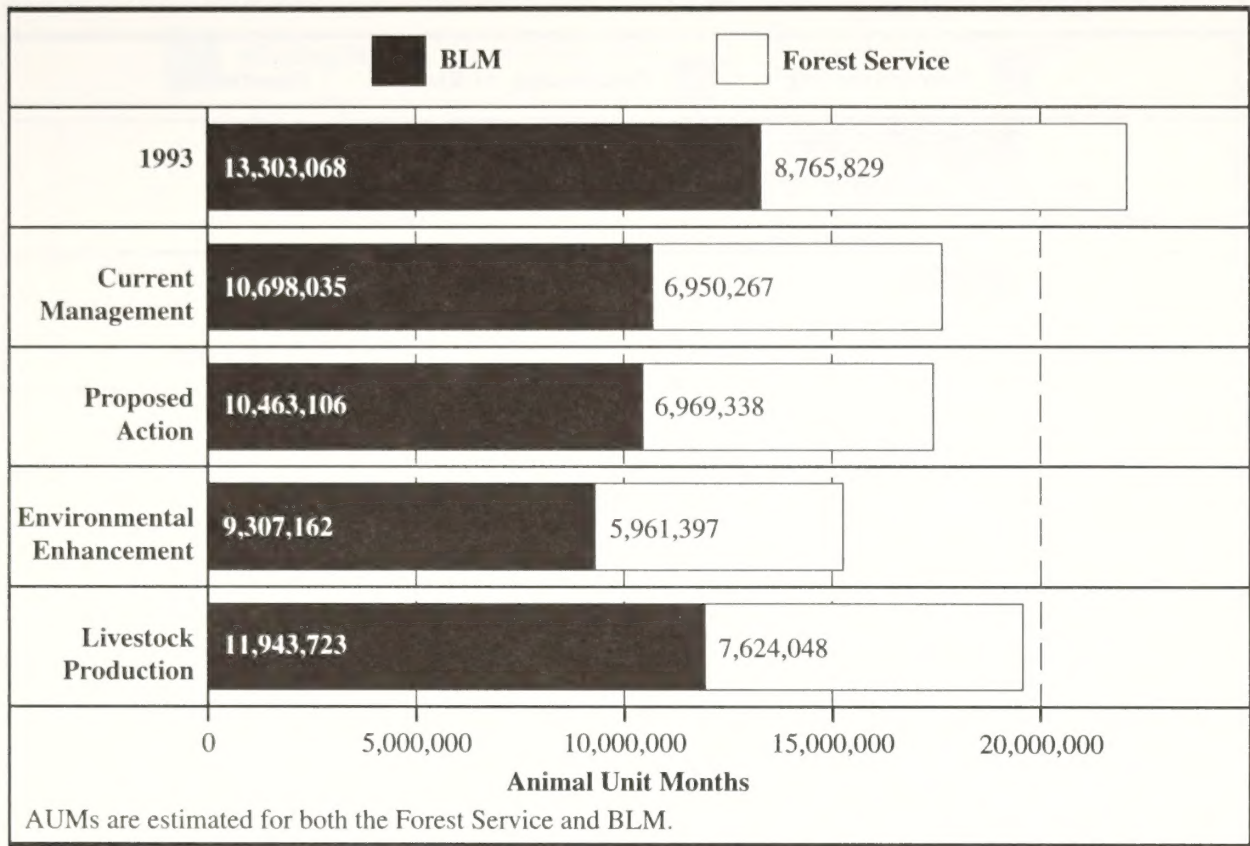
The social impacts to ranchers, ranching families, ranch employees and related businesses are far reaching and most severe under No Grazing. Many ranchers in their 50s and older would be seriously affected (the average age of ranch managers is 55). Generally as people get older, they have a harder time finding other suitable employment.

No Grazing would likely accelerate the current trend toward urbanization of some small rural communities because some ranchers would be forced to sell to outside interests.

Generally, the social well-being of recreationists and environmentalists would improve under No Grazing. This improvement would result from improved riparian and wildlife habitat and improved recreation opportunities. However, the unintended consequence of more subdivisions and real estate development could result in a reduction in environmental values.



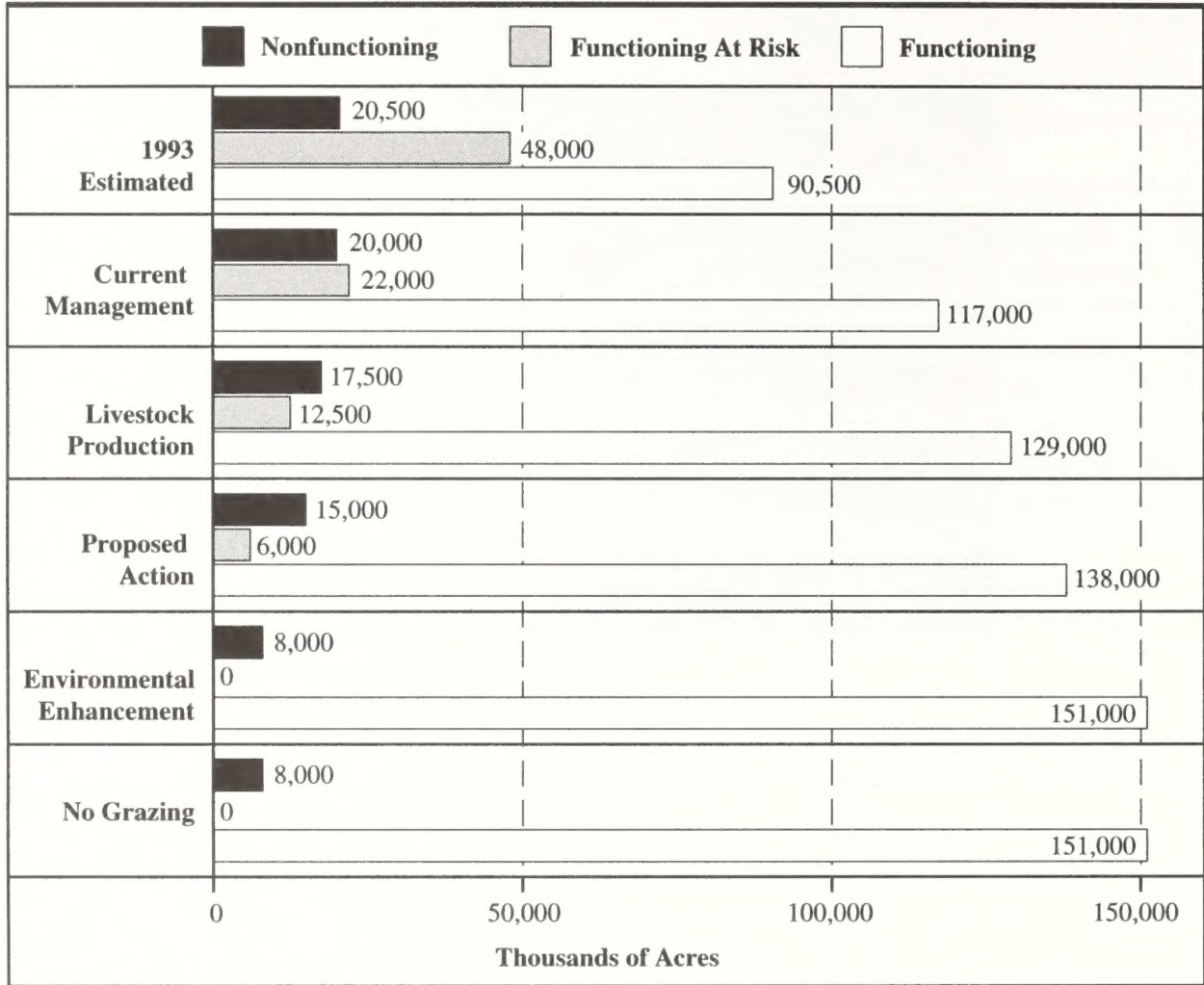
**Figure S-5: Available Livestock Forage in Animal Unit Months - Alternative Comparison - Long Term**







**Figure S-6: Changes in Functioning Condition - BLM Uplands - Comparison of Alternatives - Long Term (20 years)**





**Figure S-7: Change in Status - Forest Service Uplands - Comparison of Alternatives - Long Term (20 years)**

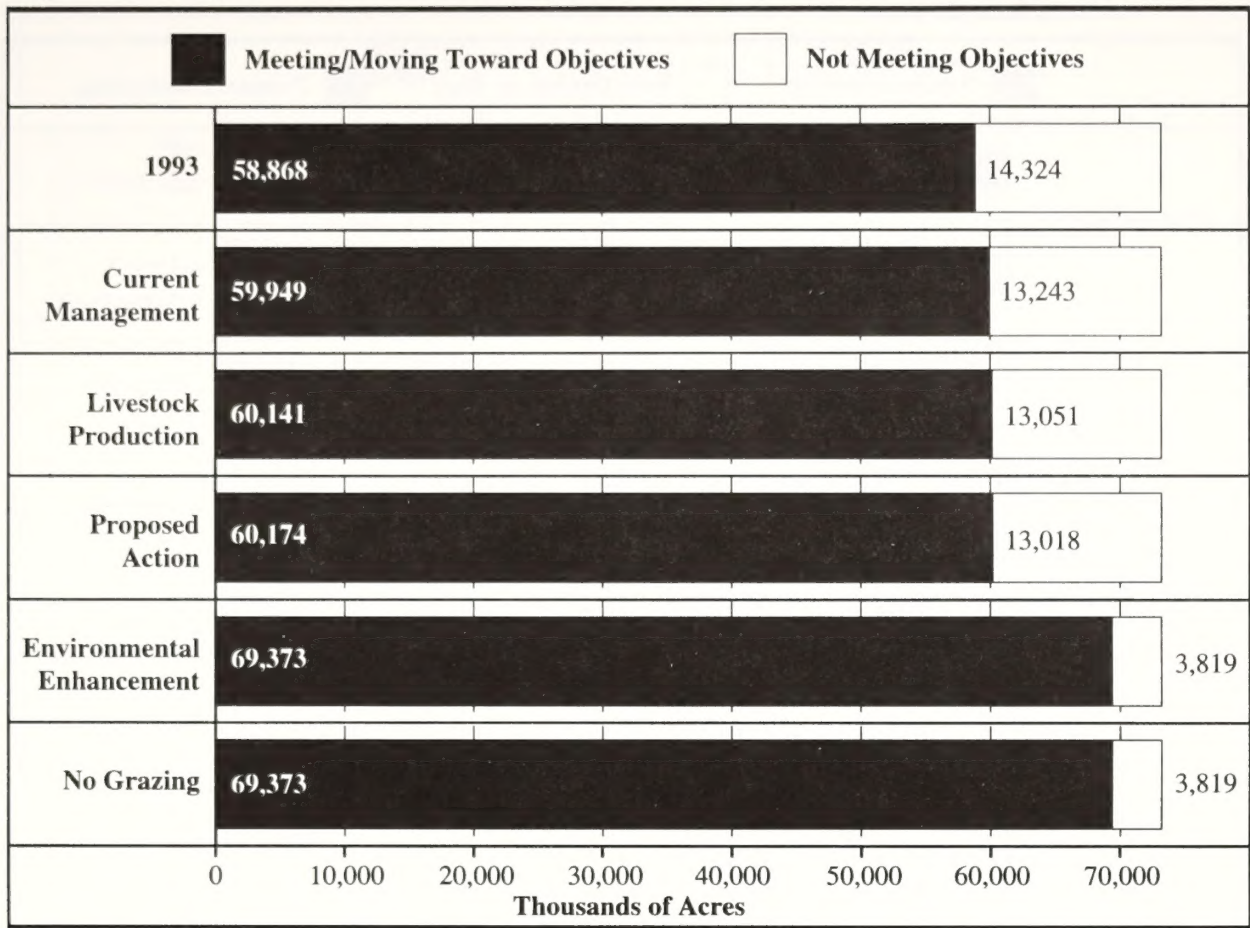
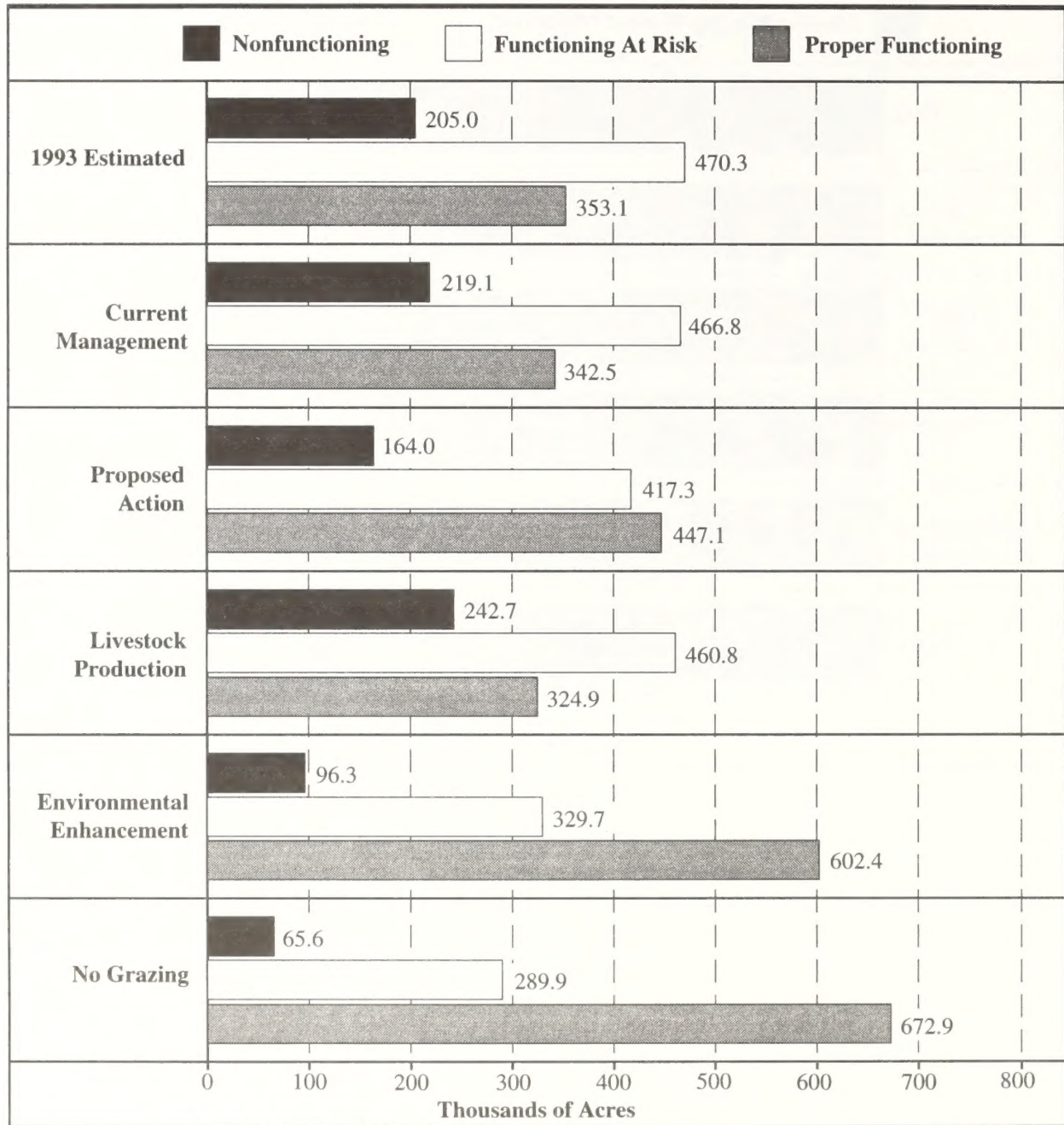






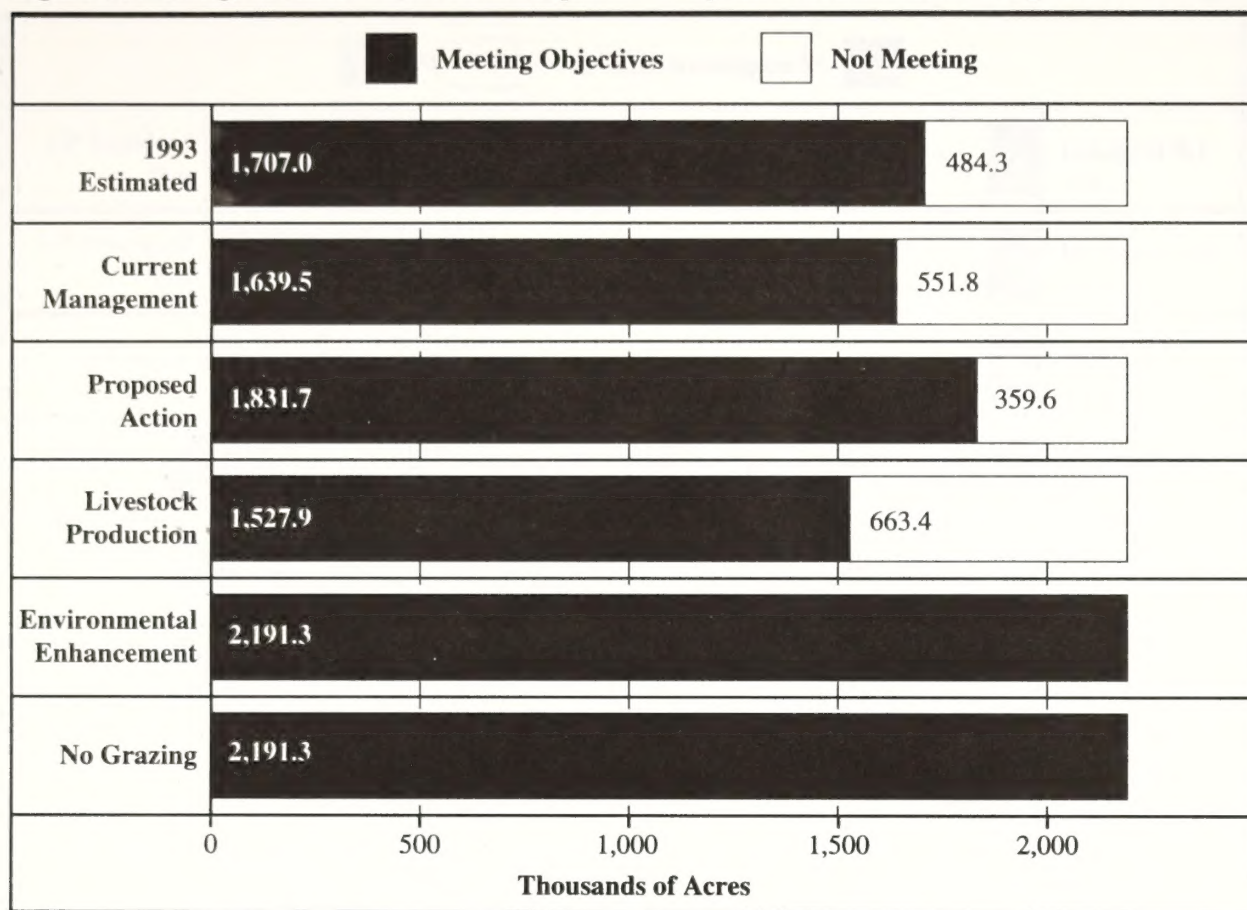
Figure S-8: Changes in Functioning Condition - BLM Riparian - Comparison of Alternatives - Long Term (20 years)



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**Figure S-9: Change in Status - Forest Service Riparian - Comparison of Alternatives - Long Term**







**Figure S-10: Reductions in Livestock Industry Income - Comparison of Impacts - Short Term (5 years)**

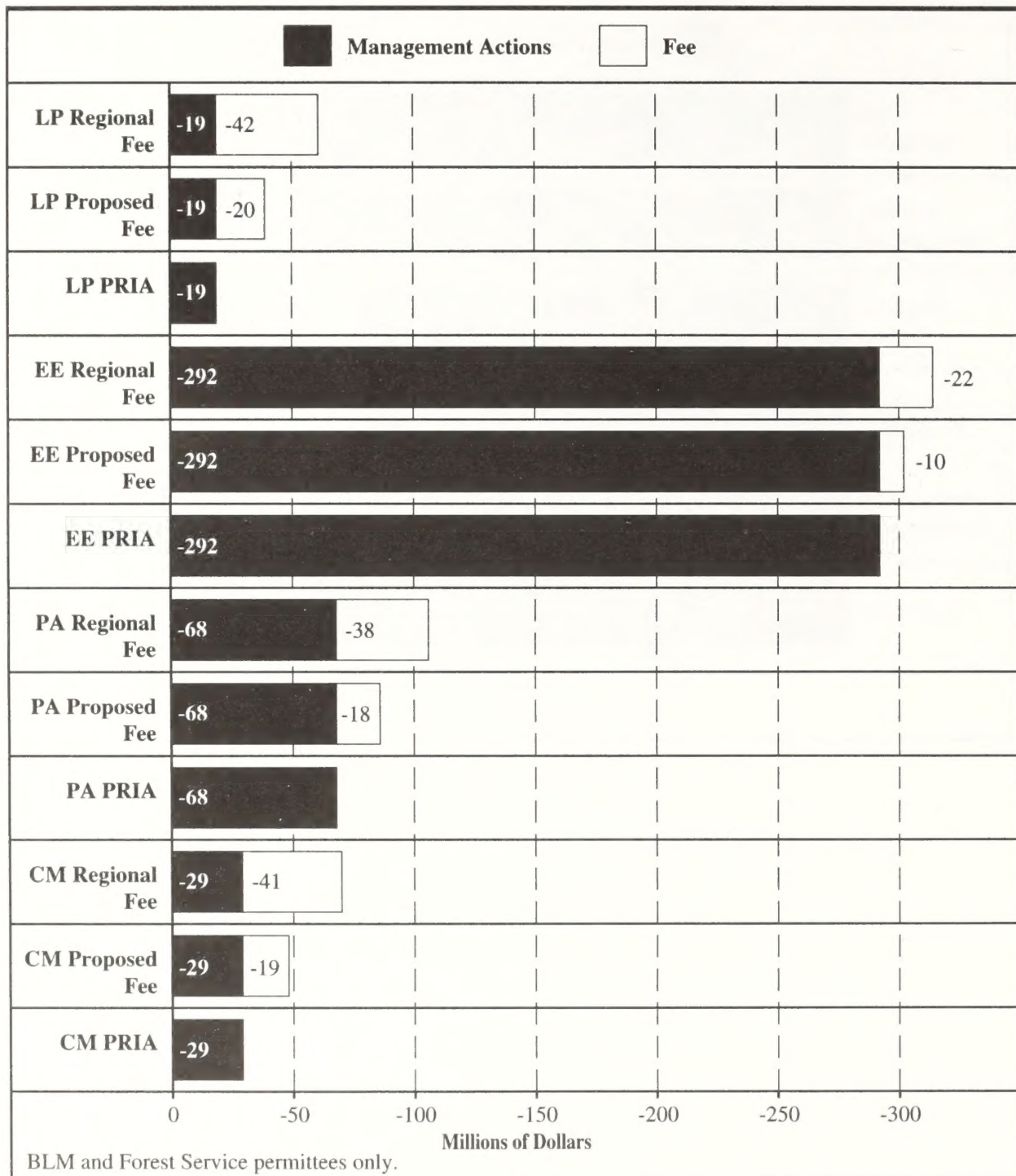
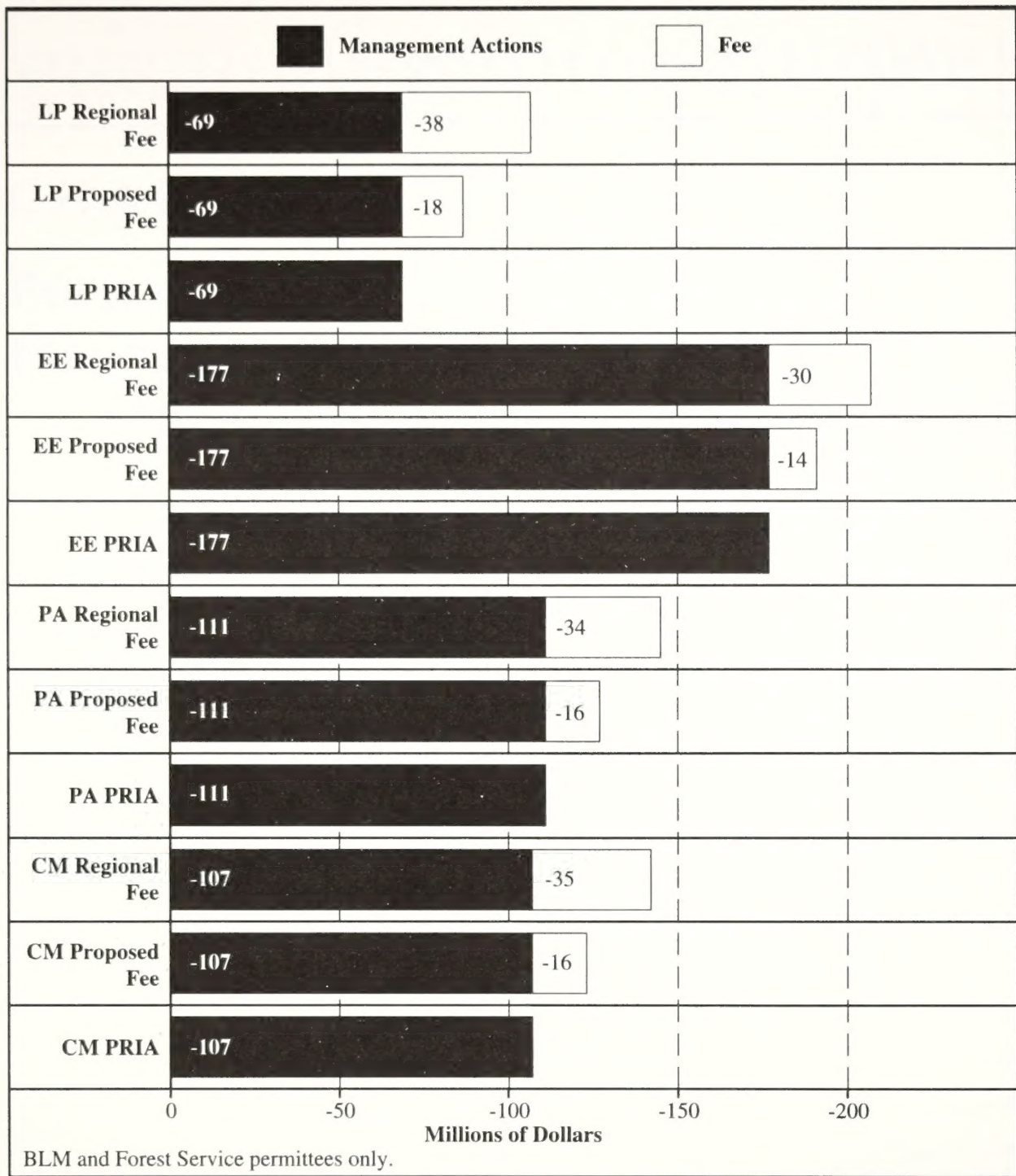


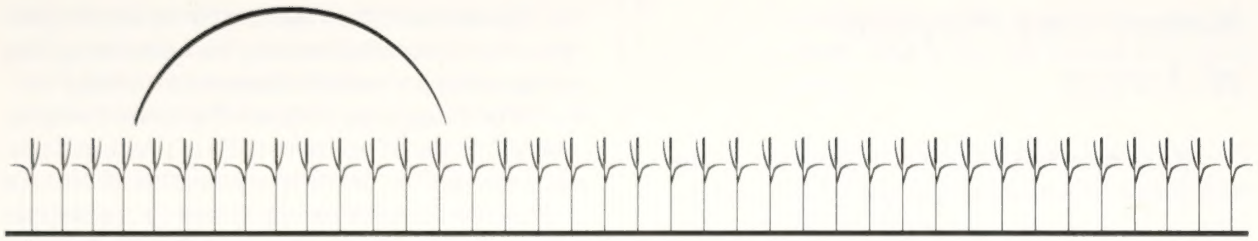


Figure S-11: Reductions in Livestock Industry Income - Comparison of Impacts - Long Term (20 years)









# CHAPTER 1

## Purpose of and Need for the Proposed Action

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## *Nature and Purpose of Action*

Rangeland Reform '94 is a proposal of the U.S. Department of the Interior (USDI) and the Bureau of Land Management (BLM), in cooperation with the U.S. Department of Agriculture and the Forest Service. These agencies administer livestock grazing on approximately 170 million acres and 100 million acres of federal rangelands respectively. The proposal involves policy and regulatory changes in BLM and the Forest Service's rangeland management programs intended to improve ecological conditions while providing for sustainable development on lands administered by the two agencies.

A major policy element of the reform package consists of national requirements and direction for developing state or regional standards and guidelines for livestock grazing on BLM-administered lands. A provision for fallback standards and guidelines to take effect if regional standards and guidelines have not been developed within 18 months is also included in the reform package.

To meet the national requirements, BLM will develop state or regional standards and guidelines and complete a plan conformance test within 18 months—subject to compliance with the National Environmental Policy Act (NEPA) and BLM's planning regulations. All standards and guidelines conforming to existing land use plans will be implemented immediately. Standards and guidelines not conforming to existing land use plans will require plan amendments and additional NEPA analysis. If regional standards and guidelines have not been developed by the end of 18 months, the fallback standards and guidelines will be implemented immediately subject to the plan conformance test and NEPA compliance.

National forest land and resource management plans have standards and guidelines for managing rangeland resources on Forest Service-administered lands. The Forest Service will continue to develop standards and guidelines at the forest plan level.

BLM and the Forest Service also propose regulatory changes in their rangeland management programs. Regulatory changes that may have a significant environmental effect either alone or cumulatively are analyzed in this document.

In addition, BLM and the Forest Service propose to change the formula for calculating fees for grazing on lands in the western states.

The Rangeland Reform '94 Draft Environmental Impact Statement (EIS) is a national programmatic EIS. It complies with NEPA and the Council on Environmental Quality's regulations governing implementation of NEPA (40 CFR 1500). NEPA requires all federal agencies to analyze the environmental impacts of any proposed action affecting public land or resources, to involve the public in decisionmaking, and to disclose environmental impacts to the public. NEPA also requires that the analysis be interdisciplinary and issue driven and that cumulative and indirect effects be reported. An EIS is required for any major federal action significantly affecting the quality of the human environment.

This EIS will serve as the NEPA analysis for the national requirements for the regional standards and guidelines, and the fallback standards and guidelines. State or regional standards and guidelines would be developed on or before 18 months after the effective date of the final rule, subject to the appropriate level of NEPA analysis. Any additional NEPA compliance will tier to the analysis of the national requirements and fallback standards and guidelines presented in this EIS. Any additional NEPA work would be at the appropriate level (that is, none, categorical exclusion, environmental assessment, or environmental impact statement, adopting other NEPA work, etc.), depending on plan conformance determinations and previous NEPA work.

## *Background*

Public rangelands are important resources, particularly for the people of the western United States. Livestock grazing has been an integral part of the western landscape and lifestyle since the late 1800s. The livestock industry has historically played a major role in the economy of the West. BLM and the Forest Service are challenged with providing a stable resource base and a reasonable return for grazing livestock on federal lands, while recognizing the growing social and economic importance of other resources to local communities.

Much controversy surrounds the interpretation of the true condition of the public rangelands. Some say the public rangelands are in better condition today than at any point during



this century. Others say the public rangelands are in unsatisfactory condition as evidenced by the widespread invasion of exotic plants and the degraded conditions in many riparian-wetland areas.

At the time it enacted the Public Rangelands Improvement Act of 1978 (PRIA), Congress concluded the following as evidenced in the findings of the Act:

- Rangelands were still producing below their potential.
- Rangelands would remain in unsatisfactory condition or decline even further under current levels of funding and management.
- The unsatisfactory condition of public rangelands presented a high risk for soil loss, siltation, desertification, water loss, loss of wildlife and fish habitats, loss of forage for livestock and other grazing animals, degradation of water quality, flood danger, and threats to local economies.

Some things have changed since the passage of PRIA. The ecological condition on most uplands has improved and most are functioning properly. But many riparian areas continue to be degraded, and are not functioning properly.

Many of the current grazing regulations either no longer provide for efficient program administration or are applied inconsistently between different areas. In addition, BLM and Forest Service regulations differ in several respects. Since many ranchers graze livestock on rangelands administered by both agencies, these differences create confusion and waste.

Over time, the costs of administering the grazing program have risen. While budgets also rose once Congress recognized the need for rangeland management, grazing fees have changed little in recent years. The increased costs of administering the livestock grazing program are approximately double the revenue generated through grazing fees. This added cost of administering the grazing program is borne mostly by the entire American public.

The intent of the changes proposed by Rangeland Reform '94 is to:

- make the Forest Service and BLM's rangeland management programs more

compatible with ecosystem management, and more consistent with each other,

- accelerate restoration and improvement of public rangelands to proper functioning condition,
- obtain, for the public, a fair payment for grazing livestock on public lands,
- streamline administrative functions, and
- consider the needs of local communities for open space and their dependence on livestock grazing

For decades the Federal Government has studied various aspects of livestock grazing on public lands. Most recently, the Forest Service began a review of its existing grazing regulations in 1987. The U.S. General Accounting Office and the Department of the Interior, Office of Inspector General audited selected features of public rangeland programs (USDI OIG 1992; GAO 1988a, 1988b, 1990, 1991a, 1991b, 1991c, 1992). The audits found several administrative and policy issues that need attention, including the following:

- the unauthorized practice of permittees leasing (rather than using) their federal permits for fees much higher than the federal grazing fee and turning a profit;
- the need for procedures to quickly correct rangeland abuse;
- the validity of BLM methods used to protect the Nation's fragile hot deserts;
- whether Range Betterment Funds are spent properly on repairing watersheds, stabilizing soil, and rehabilitating vegetation;
- the advantage of implementing an ecosystem approach to rangeland management; and
- the value of a fair return to the Federal Government from grazing fees.



The 1987 Forest Service review identified parts of the existing regulations that required revision and clarification, and other parts that were outdated and required removal. On August 16, 1988, the Forest Service published a proposed rule responding to the findings of the review [53 FR 30954]. That proposed rule has not been finished, but this EIS considers the main features of and comments received on that proposed rule.

In 1991, the BLM Director asked the agency's National Public Lands Advisory Council to recommend ways to improve BLM's rangeland management program. The council chartered a blue ribbon panel of professional ecologists and rangeland managers, who produced a report entitled "Rangeland - Program Initiatives and Strategies" (Sharpe and others 1992). The panel concluded that BLM's main objective should be to protect the basic components of rangeland—soil, water, and vegetation—and that goals to achieve this should be based on modern ecological concepts.

In the fall of 1992, several conservation organizations informed the Secretary of the Interior that they wanted BLM to improve its grazing administration by encouraging stewardship and designing ways to quickly improve the environment.

BLM organized an Incentive Based Grazing Fee Task Force in 1992 to consider ways to establish an equitable fee for federal forage and to examine the feasibility of using fee credits to encourage public land stewardship. A draft of the task force's study was presented to the Secretary of the Interior in June 1993, and many of its suggestions were incorporated in the Rangeland Reform '94 proposal (Forest Service and BLM 1993a). Also in June 1993, the Western Governors' Association drafted a resolution on grazing fees, reiterating that a healthy livestock industry is essential to the western states and acknowledging that the current grazing fee formula results in a fee, and subsequently revenue, that does not reflect the value of the forage. It called for a fee structure that is predictable, affords stability to permittees, and is linked to credits for land stewardship.

The National Research Council published a report in January 1994 entitled *Rangeland Health New Methods to Classify, Inventory and Monitor Rangelands* (National Research Council, 1994). A preliminary review of the council's publication showed that it is likely consistent with many

of the proposals and the analysis contained in this EIS. BLM and Forest Service intend to thoroughly review the report and consider its information while formulating the final EIS. Some of the information contained in the report has been used in the development of the direction for development of standards and guidelines as described in Chapter 2. Public comment on the information in the report is invited.

During a 3-month period beginning November 17, 1993, Secretary Babbitt met on 20 occasions around the West with groups which included western governors, state and local officials, ranchers, environmentalists and other public land users. He visited locations in Colorado, Wyoming, and Oregon where on-the-ground consensus groups were already engaged in addressing how land management decisions should be made, and participated in hundreds of hours of discussion about the components of rangeland reform. The meetings in Colorado, Idaho, Arizona, New Mexico, Wyoming, Oregon, Nevada and Utah resulted in many productive suggestions that are reflected in the new proposal.

As a result of public comments on the various documents distributed in the summer of 1993 and the meetings attended by the Secretary, the Department has modified many of the initial proposals for reforming rangeland management. The modified Rangeland Reform '94 proposal is described in Chapter 2. The public is asked to review this revised proposal and provide comments and recommendations for improvement. Comments on the proposed action and all of the alternatives will be analyzed in detail and considered in the preparation of a final rule. The Department also intends to hold public meetings or hearings in western grazing states to obtain input on this proposal. Announcement of the place and time for these meetings or hearings will be made in a separate notice. The Department anticipates publication of the final rule late in calendar year 1994.

## *Administrative Actions*

The following administrative actions have been undertaken concurrently to evaluate Rangeland Reform '94 and accomplish its goals: the Rangeland Reform '94 EIS, and BLM and Forest Service's rulemaking processes. An EIS is not itself a decision document. It is a document to assist the decisionmaker by disclosing the envi-



ronmental consequences of implementing a proposed action and its alternatives.

After a 90-day public comment period on the draft EIS, the BLM and Forest Service will publish a final EIS that considers the comments received. After the final EIS is published, the Secretary of Agriculture and the Secretary of the Interior will issue separate records of decision. The records of decisions and rulemakings are separate because the agencies operate under different regulatory authorities.

The records of decision will contain two related decisions:

- (1) The first decision will select the management policies that BLM and the Forest Service will adopt to satisfy the needs presented for their rangeland management programs.
- (2) The second decision will select the grazing fee structure that each agency will adopt.

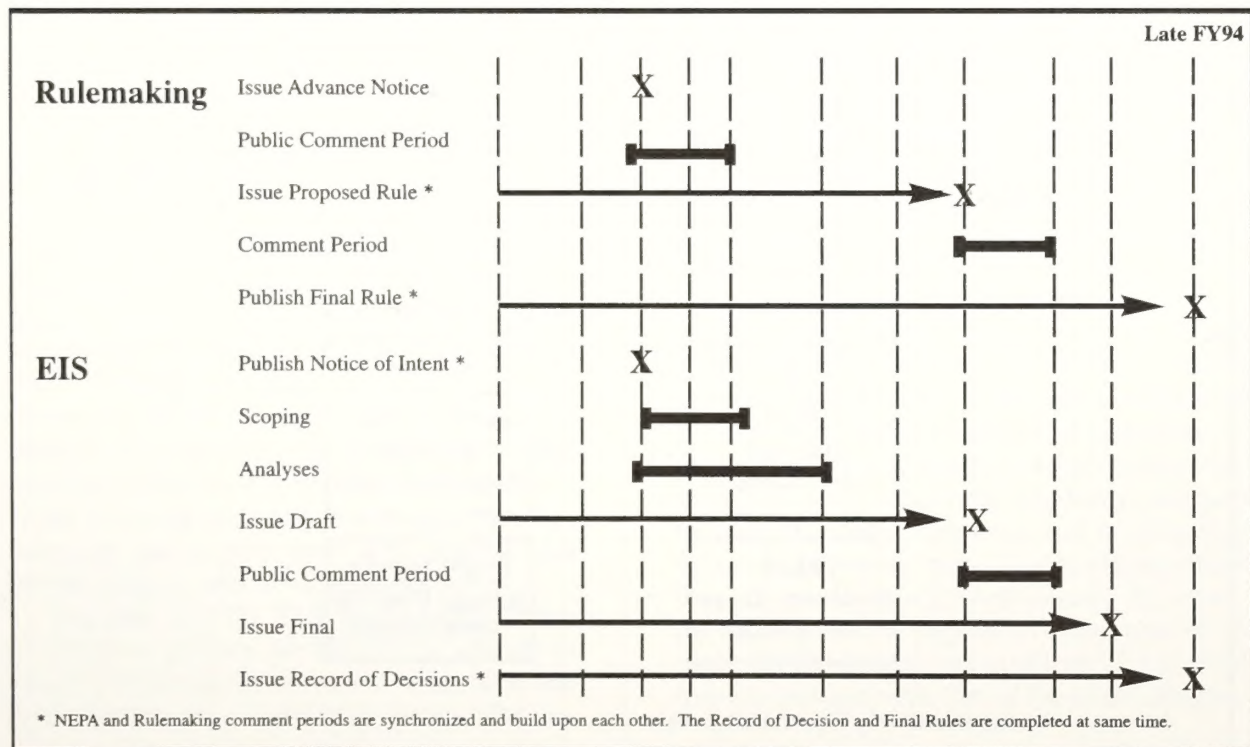
Federal agencies issue regulations to establish policies and implement administrative programs, such as grazing administration. The new regulations will implement the decisions and policies that will result from Rangeland Reform

'94. In July 1993, BLM and the Forest Service began the rulemaking process for grazing administration regulations by publishing separate Advance Notices of Proposed Rulemaking (ANPRs). Over 8,000 comment letters on the ANPRs were received between July 13 and October 20.

This process will continue through publication of proposed rules and final rules. The proposed rules are being issued for comment at the same time as the draft EIS. The final rules will be published after the Secretaries of the Interior and Agriculture review comments on the proposed rule and draft EIS, and issue the final EIS and records of decision. Figure 1-1 shows the general steps in the EIS and the rulemaking process.

BLM's main authority to manage public rangelands is established by the Federal Land Policy and Management Act of 1976 (FLPMA), the Taylor Grazing Act (TGA) of 1934, and the Public Rangelands Improvement Act of 1978 (PRIA). Through this authority, BLM is responsible for managing resources on public lands in a manner that maintains or improves them. The BLM planning regulations prescribed in FLPMA are set forth in 43 CFR 1600. Each resource management plan (RMP) and its associated EIS govern the overall management of lands and minerals in a given administrative area.

Figure 1-1: General Steps in the EIS and Rulemaking Process





The Forest Service's primary authority for managing National Forest System land is established by the Organic Administration Act of 1897, Bankhead-Jones Farm Tenant Act of 1937, Granger-Thye Act of 1950, Multiple-Use Sustained-Yield Act of 1960, federal Land Policy and Management Act of 1976, and Public Rangelands Improvement Act of 1978. Authority for developing comprehensive management plans for National Forest System lands is established by the Forest and Rangeland Renewable Resources Planning Act of 1974 as amended by the National Forest Management Act of 1976 (NFMA). NFMA also gives the Forest Service authority and direction to provide for the multiple use and sustained yield of products and services from the National Forest System. Forest Service planning regulations are found in 36 CFR 219. These regulations provide for developing forest land and resource management plans (forest plans), which define overall management direction, including standards and guidelines for managing National Forest System resources.

Rangeland Reform '94 will comply with the Federal Land Policy and Management Act of 1976 (FLPMA) mandate to protect the quality of fed-

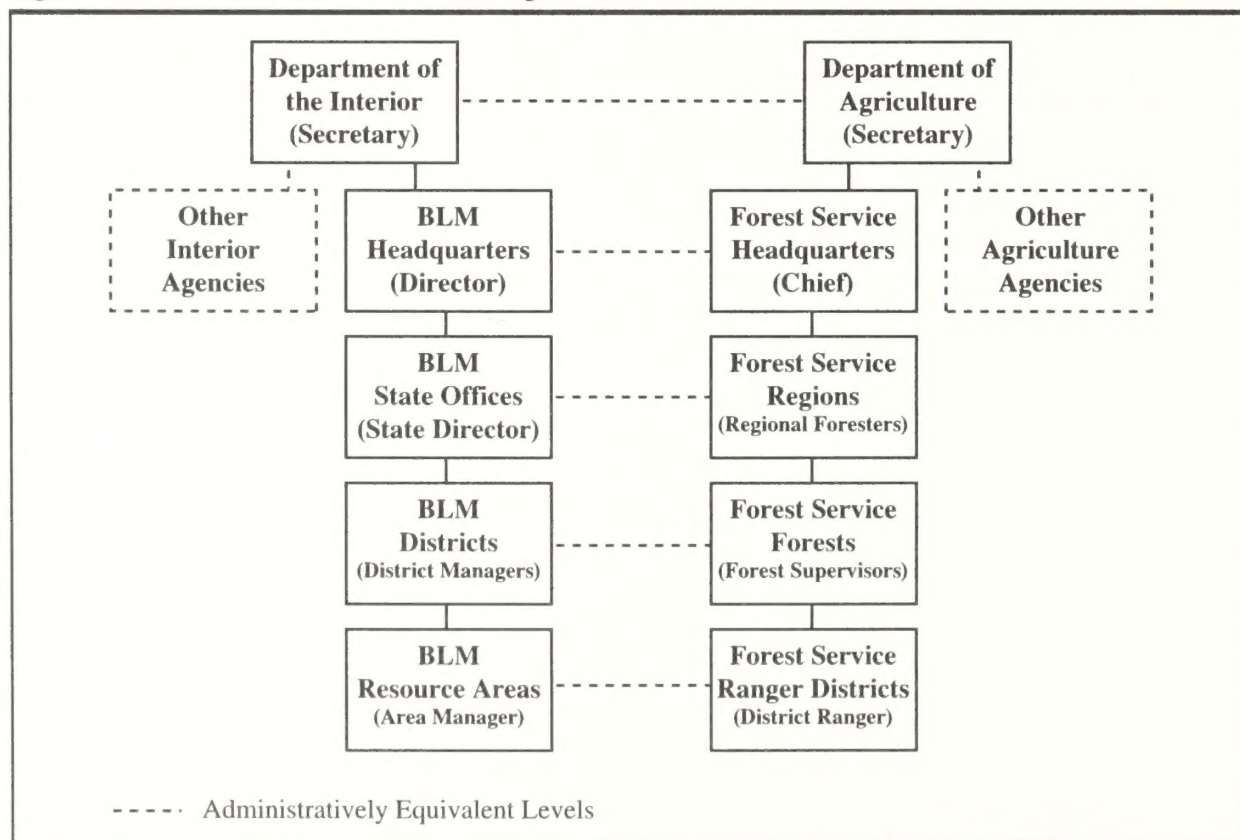
eral land resources while recognizing livestock grazing as one of the uses of the public land in the context of multiple use (FLPMA, Sec. 102 [a][8], Sec. 103 [c] and [l]). Similarly, the Forest Service recognizes the mandate of the National Forest Management Act of 1976 (NFMA) to "provide for multiple use and sustained yield of the products and services obtained therefrom [national forests] in accordance with the Multiple-Use, Sustained-Yield Act of 1960, and in particular, include coordination of outdoor recreation, range, timber, watershed, wildlife and fish, and wilderness . . ." (NFMA, Sec. 6(e)).

BLM and the Forest Service have different organizational structures, as shown in Figure 1-2.

## Study Area

BLM and the Forest Service administer livestock grazing on roughly 170 million and 100 million acres of federal rangelands, respectively. About 27,000 permittees, mainly in 17 western states, use BLM and Forest Service rangelands for livestock grazing. About 20 percent of these

Figure 1-2: BLM and Forest Service Field Organizations





permittees operate on both BLM and Forest Service administered rangelands. This draft EIS describes the physical, biological, social, and economic effects of the alternative types of management and fee formulas BLM and the Forest Service are considering for rangeland management.

Rangeland Reform '94 addresses grazing fee issues for BLM- and Forest Service-managed rangelands in the following 17 western states:

Arizona	Nebraska	South Dakota
California	Nevada	Texas
Colorado	New Mexico	Utah
Idaho	North Dakota	Washington
Kansas	Oklahoma	Wyoming
Montana	Oregon	

If a new fee is established, it would not apply to the eastern states, because BLM does not manage rangelands in the East and grazing fees on National Forest System lands in the eastern states are currently based on either fair market value or competitive bidding (36 CFR 222.53 and 222.54). The analysis and decisions made on grazing fees would also not apply to any other federally administered grazing program, including the Fish and Wildlife Service, whose grazing fees are determined under the Refuge Administration Act and 50 CFR 295. (See the fold-up land status map for federal lands affected by Rangeland Reform '94 enclosed in this EIS.)

Rangeland Reform '94 EIS applies to national forests in the states referenced above, national grasslands, and BLM-administered rangelands.

## Scoping

Scoping, that is, seeking public input, is an integral part of the environmental analysis process for determining issues and alternatives to be addressed in the draft EIS for a proposed action. Scoping for Rangeland Reform '94 was conducted on the basis of past studies (both internal and external to the agencies) and comments from diverse sources, including members of the livestock industry, environmental organizations, universities, local governments, and private citizens, and is summarized below.

On July 13, 1993, BLM published a Notice of Intent to prepare an EIS on the effects of rangeland management reform, and listed the Forest Service as a cooperating agency. The no-

tice opened the EIS scoping period by inviting participation of interested and affected parties. Public comments were received from July 13 through October 20. Because of the high level of interest demonstrated by the comments received, the scoping period was reopened for another 30 days through an August 13, 1993, *Federal Register* notice, and then for another 30 days through a September 20, 1993, *Federal Register* notice. All comments received during the period from July 13 to October 20 were considered in the scoping process for this document.

On August 13, 1993, BLM and the Forest Service each published an Advance Notice of Proposed Rulemaking in the *Federal Register*, notifying the public of their intent to revise their rangeland management regulations and soliciting comments and suggestions from the public to be incorporated in that process. Comments were received from more than 8,000 persons and organizations during the July 13 to October 20 public comment period on the ANPR. Scoping comments covered more than 150 issues and several specific suggestions. Several alternatives analyzed in this EIS were derived from comments received as a result of the Notice of Intent. Further discussion of overall public participation is included in Chapter 5.

Rangeland Reform '94 is a proposal developed by the Department of the Interior through BLM, in close cooperation with the U.S. Department of Agriculture and the Forest Service, for effecting fundamental policy changes, including adjustment of the Federal grazing fee, in its rangeland management program. The purpose of the proposed changes is to make the BLM's rangeland management program more consistent with ecosystem management, to accelerate restoration and improvement of the public rangelands, to obtain for the public fair and reasonable compensation for the grazing of livestock on public lands, and to streamline certain administrative functions. As a result of public input on the initial proposal, and as a result of the BLM's preliminary analysis of rangeland reform, two additional goals have been included: to provide a mechanism for effective public participation in decisionmaking, and to focus federal and nonfederal management efforts where they will result in the greatest benefit. In achieving these goals the Department also intends to make BLM's administration of livestock grazing more consistent with that of the Forest Service.



There are five major categories of proposed management actions addressed in Rangeland Reform '94. These categories are (1) federal grazing fee formula and associated incentives, (2) effective public participation in rangeland management, (3) administrative practices, (4) rangeland improvements and water rights, and (5) resource management requirements, including standards and guidelines. Proposed actions within each of these categories are discussed in detail in Chapter 2 of this EIS.

At the invitation of Colorado's Governor Roy Romer, Secretary Babbitt met on nine separate occasions with a group of state and local officials, ranchers, conservationists and other land users in Denver and Gunnison, Colorado, for discussions regarding a process for building a consensus-driven local approach to rangeland management. The Colorado Working Group also made suggestions to change or improve the advance Rangeland Reform '94 proposal introduced in August 1993. Similar meetings and follow-up discussions were held in Idaho, Oregon, and Nevada, in addition to meetings in Arizona, New Mexico, Utah and Wyoming. These meetings with the Secretary involved hundreds of hours of discussion. Input from these meetings and public comment resulted in many of the changes and clarifications made in the proposed action.

The following presents the general proposals of Rangeland Reform '94 and highlights significant changes made in response to public input on the advance notice of proposed rulemaking and scoping period. Detailed descriptions of the specific regulatory changes being proposed are presented in Chapter 2. Highlights of these changes are summarized below.

## Federal Grazing Fee and Associated Incentives

The Proposed Action presents a formula that is intended to correct the fundamental problems of the present fee, the wide disparity between rates charged for livestock forage on private and on federal lands and the failure to follow the trend of forage value in the private market.

The first problem is the wide disparity between rates charged for livestock forage on private and state lands versus the rate charged on federal lands. In many western states, the fee

for grazing on private nonirrigated lands is far greater than it is on federal lands. As the following chart shows, in 1993, the private grazing land lease rates in most western states were several times the federal fee.

### 1993 Private Nonirrigated Grazing Land Lease Rates Dollars per Animal Unit Month (National Agricultural Statistics Service)

Federal Fee .....	\$ 1.86
Arizona .....	5.72
California .....	10.40
Colorado .....	9.70
Idaho .....	9.25
Kansas .....	11.30
Montana .....	11.40
Nebraska .....	17.00
Nevada .....	8.80
New Mexico .....	7.55
North Dakota .....	10.00
Oklahoma .....	7.10
Oregon .....	9.75
South Dakota .....	12.60
Texas .....	8.75
Utah .....	8.90
Washington .....	7.80
Wyoming .....	10.50

There are similar disparities between grazing fees charged on state lands and the federal fee. For grazing year 1994 the federal grazing fee established under existing regulations in 43 CFR part 4100, is \$1.98 per animal unit month (AUM). This fee compares to western state trust land fees of as low as \$1.53 in Arizona to fees ranging from \$4.00 to more than \$20.00 in some of the western states for their 1994 grazing year. The different formulas, and the use of competitive bidding in some states, make it difficult to present an average of the state trust land grazing fees, but in the states of Nevada, New Mexico, Wyoming, Montana, and Idaho, the largest states in terms of the number of BLM AUMs authorized, the state trust land fees per AUM range from a low of \$3.00 in Wyoming to \$4.53 in Idaho in 1994.

A second problem of the current fee formula is that while forage value in the private market has increased substantially over time, the federal grazing fee formula has produced relatively small increases and, in some years, decreases. In 1980, for example, the private grazing land



lease rate for the 11 western states, weighted by survey weights as determined by the National Agricultural Statistics Service, was \$7.53, while the federal fee was \$2.36; thus, the difference between the private and federal rates in 1980 was \$5.17. In 1993, the private grazing land lease rate for the 11 western states was \$10.03, while the federal fee was \$1.86. Thus, the difference between the two figures had jumped to \$8.17.

The proposed formula would address the failure of the existing formula adequately to reflect private grazing land market conditions by including a base value that considers the cost differences of operating on public lands as compared to private leases, as well as appraisal data, and by annually adjusting the fee in proportion to changes in private grazing land lease rates. After an initial phase-in period, the fee would be adjusted annually to reflect the change in the private land lease rate in the 17 western States (that is, forage value index). Although no explicit index based on production costs or value of products produced is used, both factors influence the prices paid for forage and so are, to some extent, implicit in the forage value index. The proposed formula is essentially a return to the simpler formula that was in effect before 1978 using an updated base value.

While the proposal would move toward greater equity among fees, it would still result in a fee below the fees charged for grazing on state lands in most western states, and would fall well below private grazing land lease rates. The amount by which the fee would increase is similar to recent increases that have taken place at the state level; those increases have not led to noticeable shifts in the livestock industry or economic effects on communities in those states. This, when considered with the reasonableness of the proposed fee increase and the fact that more than 73 percent of BLM permittees and lessees would experience a fee increase of less than \$1,000 per year, offers evidence that the proposed change in the fee would generally not have a significant impact on the stability of the dependent western livestock industry and would not have a serious detrimental effect on most permittees and lessees. Some permittees and lessees that are highly dependent on federal forage, do not have off-ranch income, and have heavy debt loads may be required to make some financial adjustments. These adjustments, in some circumstances, may include sale of the ranch; however, it is expected that such sales will

occur in limited circumstances. Such sales, it should be noted, are occurring and will continue to take place under current conditions, as well.

The economic impact on western communities is expected to be localized and, in most areas, not significant because that portion of the local economy that depends upon the use of federal forage is relatively minor.

The initial proposal generated a great amount of public comment both for and against increasing the fee. Most of the comments related to the anticipated impacts to individual operators and to rural western economies. Many respondents suggested regional economic differences, the cost of investment in public lands, and overall rangeland resource conditions should be considered in determining grazing fees. Some felt the proposed fee would be economically devastating, and some felt that a fee increase was warranted, but the proposal represented too little or too great an increase.

As a result of the public input gained following the advance notice of proposed rulemaking and through the scoping process for the environmental analysis of Rangeland Reform '94, the Departments have determined that the fee formula initially proposed represents a reasonable and equitable method for calculating the fee. However, an adjustment in the forage value index is proposed in this draft. A provision for an incentive-based fee has been added.

A base value of \$3.96 per animal unit month (AUM) is proposed. This value represents a midrange between the results obtained through the use of two methods for estimating a fair base value. Explanation of the methodology used in arriving at the \$3.96 base value is presented in Appendix C. The proposed fee would be phased in over the years 1995 through 1997. Thereafter, annual increases or decreases in the grazing fee resulting from changes in the forage value index would be limited to 25 percent of the amount charged the previous year to provide for a measure of stability that would facilitate business planning.

The Proposed Action would establish 1996 as the base year for the forage value index. The forage value index would not be used to annually adjust the fee in response to market conditions until the year 1997. The proposed action would establish the 1995 grazing fee at \$2.75, and the 1996 grazing fee at \$3.50. Thereafter the fee would be calculated, except as provided below, using the base value of \$3.96 multiplied



by the revised forage value index. By definition, the forage value index in the year 1996 would equal one; yielding a 1997 grazing fee of \$3.96. In subsequent years the calculated fee would depend on the changes in the market rate for private grazing land leases as reflected by the forage value index.

This change in the derivation of the forage value index is proposed to reduce the uncertainty in the fee in the immediate future that resulted from using a forage value index based on less current private land lease rate data. Under the proposal presented in the advance notice of proposed rulemaking, the fee would have been adjusted annually by a forage value index based on the average price paid for private grazing in the years 1990 through 1992. Assuming that forage value index would have remained constant until the end of the phase-in period provided in the advance notice, the formula would have yielded a grazing fee of \$4.28 per AUM as compared to a 1997 fee of \$3.96 per AUM using the revised forage value index.

The Department intends to examine the effect of the proposed grazing fee during the phase-in period to determine the need for any adjustment in the fee formula.

New provisions have been added to the proposal that would provide for an incentive-based grazing fee and would restrict implementation of the \$3.96 base value in the event a separate regulation setting forth eligibility criteria is not issued by 1997. In recent years the Departments have considered several proposals for incentive-based grazing fees targeted at permittees and lessees who have improved rangelands and contributed to healthy, functional ecological conditions. The Departments recognize that an incentive-based fee would be a valuable tool for encouraging stewardship. It was not possible to develop proposed eligibility criteria for the incentive-based fee in time to include them in Rangeland Reform '94. However, the Departments have included in the Proposed Action a 30 percent reduction in the grazing fee for grazers who practice good stewardship of public lands. The 30 percent reduction would be implemented as soon as the Departments complete a separate rule making setting forth the eligibility criteria. These criteria would focus primarily upon those permittees and lessees who agree to participate in special rangeland improvement programs characterized by best management practices, the furtherance of resource condition

objectives, and comprehensive monitoring. The Department anticipates that eligibility criteria would require the permittee or lessee to undertake management practices beyond those otherwise required by law and regulation to benefit the ecological health of the public rangelands.

To ensure timely development of that rule, this proposed action provides that an alternative base value of \$3.50 would be implemented in 1997 if the Departments have not completed the eligibility criteria. Such a discount would result in a grazing fee of \$2.77 per AUM in 1997 for qualifying permittees and lessees. The Department intends to use its best efforts to issue a final rule establishing incentive criteria in time to provide an opportunity for the reduced fee in grazing year 1996. Such a discount would result in a grazing fee of \$2.77 per AUM in 1996 and 1997 for qualifying permittees and lessees. Reviewers are asked to provide suggested criteria for qualifying for the reduced fee that address the improvement and maintenance of rangeland health.

## Effective Public Participation

An important element of true rangeland reform involves allowing more Americans to have a say in the management of their public lands. The American rangelands can be—and are—used for far more than grazing. Hiking, birding, fishing, hunting, and mountain biking are among the activities that are compatible with sound grazing practices. All of the public interests will be served by the public lands as long as all of the public interests are represented when decisions are being made. Thus, increased public participation is essential to bringing lasting changes to management of our public lands.

Included in this general category are proposals for the formation of multiple resource advisory councils in most BLM administrative districts and the involvement of the multiple resource advisory councils in the development of standards and guidelines for grazing; a provision allowing multiple resource advisory councils to establish and select members of resource teams and technical review teams for the purpose of providing input to be used by the multiple resource advisory council in developing recommendations; removal of references to the National Public Lands Advisory Council, district advisory councils, and grazing advisory boards;



and modification of how interested members of the public can become involved in specific grazing decisions.

Most comments generated during scoping, and a great deal of the input gained through the Secretary of Interior's visits to western states, supported modification of the initial proposal to expand the definition of affected interests, eliminate grazing advisory boards and district advisory councils, and create regional resource advisory councils. Many comments expressed a concern that local input would be overshadowed by interests not directly affected by the decisions to be made while others asserted that all citizens should have an equal say in the management of public lands. There was also a great amount of interest in making public participation more effective by encouraging consensus-based forms of decisionmaking.

During the period of November 1993 through January 1994, Governor Romer of Colorado convened and conducted several meetings of the Colorado Rangeland Reform Working Group. Although this working group considered many of the proposals of Rangeland Reform '94, a key finding of the group was that the current framework employed by the Department of the Interior and the BLM for encouraging community-based involvement was inadequate. This issue became the focus of much of the working group's efforts. The working group prepared a summary of its findings and a model for enhanced community-based involvement. The Department agrees with the findings of the group and has attempted to incorporate the model for public involvement in the Proposed Action.

## Administrative Practices

Included in this category are disqualification of applicants for grazing permits and leases, procedures for the review of administrative appeals and implementation of decisions, issuance of grazing preference, a surcharge for the authorized leasing or subleasing of grazing preference associated with base property or pasturing of livestock owned by other than the permittee or lessee, suspended nonuse, and unauthorized use.

Both BLM and the Forest Service have changed the initial proposals affecting administrative practices in response to public input.

Aspects of the initial proposals regarding administrative practices that received the most comments were adjusting permit and lease tenure as a performance incentive, implementing full force and effect of decisions, disqualifying applicants who have had permits canceled for violating terms of federal grazing permits, imposing leasing surcharges, and eliminating suspended nonuse.

The proposal to limit permit and lease tenure in some instances to 5 years has not been carried forward from the advance notice of proposed rulemaking. Public comment on the advance notice suggested the proposal would do little to encourage stewardship and would inadvertently penalize operators new to public land grazing, especially those starting in the business, by inhibiting their ability to secure necessary financing. The Department agrees that the proposal in the advance notice related to permit and lease tenure could result in unacceptable impacts and has withdrawn that proposal.

The proposal in the advance notice of proposed rulemaking to place grazing administration decisions in full force and effect generated some confusion and has been clarified in the proposed action. The objective of placing decisions in full force and effect is to expedite placing decisions into effect to benefit resource conditions and to address administrative problems. The proposal would not take away the ability of affected parties to file an appeal or to request a stay of the decision until such time as the appeal is decided. The Department believes this is critical to meet the goals of streamlining administration and focusing limited resources where they can do the most good, and has retained the substance of the initial proposal. An attempt has been made to clarify the explanation of the proposed appeal provisions in this rule.

Under the proposed action, persons choosing to appeal a decision of the authorized officer would be provided a 30-day period in which to file an appeal. Appellants requesting a stay of the decision would be required to file a petition for stay with their appeal. In the instance where a petition for stay has been filed with an appeal, the Department of the Interior's Office of Hearings and Appeals would have 45 days from the expiration of the 30-day appeal period either to grant or deny the petition for stay, in whole or in part. Thus, where a person has filed a petition for stay of the decision of the authorized officer along with an appeal, and where



the request for stay is denied, implementation of the decision could be delayed up to 75 days. In the event a stay of the decision is granted, the decision would be stayed until such time as a determination on the appeal is made.

The initial proposal by BLM to disqualify applicants for grazing permits if their state or federal grazing permits have been canceled during the past 36 months has been modified in response to public comment. The new proposal would limit disqualification to applications for new or additional permits and leases. Also, consideration of an applicant's history of compliance with the terms and conditions of state permits and leases has been limited to state permits and leases within the boundary of the federal grazing allotment for which application has been made. Cancellation of such state permits or leases within 36 months prior to application would disqualify applicants for new or additional federal permits or leases.

The advance notice of proposed rulemaking provided for automatic disqualification on the basis of the suspension or cancellation of an applicant's other federal or state grazing permits or leases during the 36 months prior to application. Under the proposed action, the consideration of an applicant's history of performance on other federal or state grazing permits or leases would not apply to applicants for the renewal of a BLM grazing permit or lease. The Department invites comment on whether an applicant's history of performance on other federal and state grazing permits and leases should be added as a discretionary, rather than automatic, basis for determining qualification for the renewal of a BLM grazing permit or lease. Also, the Department invites comment on whether a similar provision for a discretionary review of past performance should apply to applicants for new or additional BLM permits or leases, in addition to the automatic disqualification where an applicant has had a federal or state permit canceled for violation during the 36 months prior to application.

The Forest Service's initial proposal on disqualifying applicants for grazing permits has not changed.

A new provision has been added to clarify that partial suspension of a federal grazing permit would not be grounds for disqualification. Permits are partially suspended as a punitive measure where permittee actions do not justify

cancellation. The agencies believe that disqualification on the basis of partial suspension would amount to excessive punishment and would reduce the usefulness of partial suspension in addressing violations.

Many comments were received on the Department of the Interior's proposal for BLM to levy a surcharge when the private property serving as a base for public land grazing is leased or when livestock not owned by the permittee are pastured on public lands. This proposal responded to findings of the General Accounting Office (GAO 1986) and the Office of the Inspector General (USDI OIG 1992) that permittees and lessees who sublease are unduly benefitting from their permits or leases.

A major criticism of the initial proposal was that it would penalize children of permittees who are grazing a few animals as an educational or group project or trying to build a livestock herd in anticipation of assuming all or part of the family operation. Recognizing the need to avoid penalizing children of grazing permittees, the Department of the Interior proposes to exempt sons and daughters of permittees from the surcharge.

A broader criticism, which surfaced during meetings in Nevada, is that most pasturing agreements are a means of financing available to ranchers who might not be able to finance their own inventory, and that contrary to the findings of the General Accounting Office reports, they do not involve windfall profits taken by absentee landlords and permit or lease holders. Some Nevada participants also suggested that any surcharge on the subleasing of permits and leases should be formulated as a percentage of the return on the sublease rather than a percentage of the federal grazing fee. The Department invites comment on these two considerations.

The BLM proposal to eliminate suspended nonuse generated concern that property rights and financing agreements would be affected. The Interior Department does not agree with these comments. For the most part it appears that these suspended AUMs have no real impact on ranches or on the condition of public lands. The initial proposal was intended to remove all reference to suspended nonuse because only in rare instances has forage placed in this category been made available for livestock consumption. However, given the contentious nature of the issue and the fact that the Department views the mat-



ter as merely an administrative record-keeping issue, the proposed action does not carry forward the elimination of suspended nonuse presented in the advance proposal.

Some of the comments received on the proposals relating to prohibited acts suggested that the proposed wording was subject to broad interpretation that could lead to punitive action in response to violations unrelated to grazing use. The regulations governing "Prohibited Acts" would be amended to modify the list of acts that are prohibited on public lands that could result in the loss of grazing permits or leases. Particular attention is invited to the proposed regulation which refers to federal or state laws or regulations concerning, among other things, conservation or protection of natural and cultural resources or environmental quality when public lands are involved or affected.

There are, of course, a great many laws or regulations that might fit within this category. These laws have independent enforcement authority; that is, violations are dealt with under penalty provisions in these laws themselves. This section of the existing regulations provides the possibility, in addition to these penalty provisions, of loss of the grazing permit or lease for violations.

References to the term "affected interests" have been removed throughout the proposed action and replaced with the term "interested public." The proposed action would also remove the authorized officer's current discretion to determine whether an individual is an "affected interest." These changes were not included in the advance notice of proposed rulemaking.

The reason for the change is to provide a consistent standard for participation by the public. Any party who writes to the authorized officer to express concern for the management of livestock grazing on specific grazing allotments will be recognized as a member of the "interested public" under the proposed action. This allows the BLM to develop a record to assure notification of proposed and final decisions and to involve the "interested public" in the consultation process.

Requirements for consultation with the interested public have been added in sections of the proposed action that deal with the initial allocation of forage, development of activity plans and range improvement programs, the issuance or renewal of grazing permits or leases,

and the establishment or adjustment of the terms and conditions of grazing permits and leases.

The advance notice of proposed rulemaking included provisions that would allow the authorized officer to issue final decisions without first issuing a proposed decision in specified circumstances. This proposal would carry forward the provision that the authorized officer could directly issue final decisions when decisions are necessary to protect rangeland resources from damage in "emergency" situations, and would add that decisions to close areas to certain forms of livestock use when necessary to abate unauthorized use, could be issued as final decisions without first issuing proposed decisions. The provisions are necessary to provide responsive action in these circumstances. The other circumstances specified in the advance notice that would not have required a proposed decision were nondiscretionary decisions, decisions that were previously part of a broader final decision that was initially issued as a proposed decision, and decisions that involve the application of discretion within the established terms and conditions of grazing permits and leases. These categories have been removed from the proposed action. However, there may be circumstances where resource protection and administrative efficiency could be enhanced by avoiding the delay of implementation that occasionally can result from the protracted resolution of protests of proposed decisions. In all cases, the right to appeal final decisions to the Office of Hearings and Appeals would be retained. The public is invited to comment on whether there should be additional circumstances where the authorized officer should have the ability to issue final decisions without first issuing a proposed decision.

A new provision has been included in the proposed action to eliminate the requirement for prolonged implementation of necessary reductions in permitted livestock use when data, including field observations, show grazing use or patterns of use are not consistent with standards and guidelines, are causing an unacceptable level or pattern of utilization, or grazing use exceeds the livestock carrying capacity of the area. Under the existing regulations, necessary reductions in livestock use of more than 10 percent have been phased in over a period of 5 years. Although that provision may, in the short term, mitigate some of the adverse effects



on permittees and lessees, it has inhibited responsive action in situations where reductions in use are most needed. Under the proposed action, the authorized officer, after consultation with the affected permittee or lessee, the state having lands or managing resources within the area, and the interested public, would take action to reduce grazing use either by reaching an agreement with the involved parties or by decision. The Department anticipates that, in many cases, agreements can be reached that would result in gradual reductions in use. However, the Department recognizes the need to provide for responsive action where rangeland health and function is not being maintained.

Other proposals within the category of administrative practices have been modified somewhat in response to comments received, while attempting to retain the general substance of the proposed actions. Also, an attempt has been made to clarify many of the explanations of proposals, and to refine the regulatory text to more accurately achieve the objective of the initial proposal.

## Rangeland Improvements and Water Rights

The initial proposals pertaining to ownership of range improvements and water rights generated a great number of comments. Most of the comments were not opposed to the intent of the proposed changes to conform with the common practice of keeping title to permanent improvements in the name of the party holding title to the land. However, many respondents expressed concern that the wording suggested that the Federal Government would take existing rights to range improvements and water. The text pertaining to range improvement ownership has been modified in the proposed action and a new section has been added to clarify the provisions for water rights associated with livestock grazing on public lands.

The proposed action would require that title to all new grazing-related improvements constructed on public lands, or made to the vegetation resource of public lands, except temporary or removable improvements, would be in the United States. Since the proposed change would be prospective, valid existing rights to range improvements and compensation therefor under section 402(g) of FLPMA (43 U.S.C. 1752(g))

would not be affected. The permittee or lessee may hold title to removable range improvements authorized as livestock handling facilities such as corrals, creep feeders and loading chutes, and to temporary improvements such as troughs for hauled water. With respect to new permanent improvements, a permittee's, lessee's, or cooperator's interest for contributed funds, labor, and materials would be documented. This documentation is necessary to ensure proper credit pursuant to section 402(g) of FLPMA, which provides compensation for the permittee's or lessee's authorized permanent improvements whenever a permit or lease is canceled, in whole or in part, in order to devote the lands to another public purpose. New permanent water improvement projects such as spring developments, wells, reservoirs, stock tanks, and pipelines, would be authorized through cooperative range improvement agreements.

The proposed action would carry forward the proposals in the advance notice regarding the distribution and use of range improvement funds and add a requirement to consult with multiple resource advisory councils during the planning of range development and improvement programs.

The proposed action provides consistent direction for the BLM regarding water rights on public lands for livestock watering purposes. It is intended to generally make BLM's policy consistent with Forest Service practice, and with BLM policy prior to being changed in the early 1980's.

Under the proposed action, any new rights to water on public land for livestock watering on such land would be acquired, perfected, maintained, and administered under state law. In all cases involving the development and registration, pursuant to state law, of new rights to water on public land for livestock watering, cooperative agreements will be used to provide that such livestock water rights are to be used and maintained in conjunction with the grazing permit or leases and do not give rise to a claim for compensation in the event the permit or lease to which it is attached is canceled in whole or in part to devote the lands to another public purpose.

The proposal would not create any new federal reserved water rights, nor would it affect valid existing water rights. Any right or claim to water on public land for livestock watering on public land by or on behalf of the United



States would remain subject to the provisions of 43 U.S.C. 666 (the McCarran Amendment) and section 701 of FLPMA (43 U.S.C. 1701 note; disclaimer on water rights). Finally, the proposal would not change existing BLM policy on water rights for uses other than public land grazing, such as irrigation, municipal, or industrial uses.

With respect to new water rights, some comments have suggested that permittees and the United States file jointly for water rights on public lands associated with livestock watering on public lands. When permitted by state law or regulation, for ease of administration, co-application with the lessee could be authorized, as it is in Wyoming. The proposed action does not contain such a provision, although if joint filing is permitted under state law, and filing exclusively in the name of the United States is not, then the proposed language would permit joint filing. Comments are specifically sought on whether the rule should mandate joint filing to the extent consistent with or even if not permitted under, state law or if the current language in the proposed action is preferable. Comments are sought in particular on whether co-applications should be allowed where it would not change the underlying ownership of the water right.

## Resource Management Requirements

Public comments on the standards and guidelines included as an appendix to the advance notice of proposed rulemaking generally expressed doubt that it is possible to develop a set of national standards and guidelines that could be universally applied to grazing administration on public lands. Many reviewers recommended that standards and guidelines should only be developed at a more local level. Many comments also expressed uncertainty regarding whether the standards and guidelines would have the effect of law given they were presented as an appendix rather than proposed regulatory text.

The Department of the Interior agrees that standards and guidelines prepared at a more local level would be better tailored to fit resource conditions and livestock management practices. Therefore, the Department has not carried forward the standards and guidelines as included

with the initial proposal. However, in order to promote greater administrative consistency, and to focus management attention and resources where they will result in the greatest environmental benefit, the Department recognizes a need to establish clear national requirements for grazing administration and guidance for the preparation of State or regional standards and guidelines. These national requirements and guiding principles for state or regional standards and guidelines have been included in the text of the proposed action. In addition, the Department recognizes the importance of putting standards and guidelines in place in a timely manner, and has provided a mechanism for doing so in this proposal.

The Department intends that state or regional standards and guidelines for grazing administration would be developed in consultation with multiple resource advisory councils, interested public, and others within 18 months following the effective date of the final rule. In the event state or regional standards and guidelines have not been completed and approved by the Secretary within 18 months of the effective date of the final rule, fallback standards and guidelines provided in the proposed action would be implemented subject to conformance with land use plans and compliance with NEPA (42 U.S.C. 4331 *et seq.*, NEPA). The Department feels this provision for fallback standards and guidelines is needed to provide for necessary resource protection and to encourage prompt action toward the development of state or regional standards and guidelines. The fallback standards and guidelines would also provide a benchmark by which to measure the adequacy of state or regional standards and guidelines.

The national requirements, guiding principles for the development of state or regional standards and guidelines, and the fallback standards and guidelines proposed in this rule all focus on attaining and maintaining healthy rangeland ecosystems, including riparian areas. The Department recognizes that achieving and maintaining properly functioning ecosystems is critical to the protection of public rangelands and resources, and resource uses. Achieving and maintaining healthy rangeland conditions greatly benefits resources and uses such as wildlife and fish habitat, water quality, and recreational activities. Although BLM land use plans and activity plans may provide for achieving resource conditions that go beyond the bench-



marks for ecological health and functional condition proposed in this rule, achieving properly functioning ecosystems is prerequisite to the conservation of rangeland resources.

The national requirements for all grazing-related plans and activities on public lands under this proposal include continuing or implementing grazing practices that maintain or achieve healthy, properly functioning ecosystems and riparian systems; continuing or implementing grazing practices that maintain, restore or enhance water quality and assist in the attainment of water quality that meets or exceeds state water quality standards; and continuing or implementing grazing management practices that assist in the maintenance, restoration, or enhancement of the habitat of threatened or endangered species, or species that are classified as candidates for threatened or endangered species listing. These requirements are intended to reflect the fundamental legal mandates for the management of public lands under the Taylor Grazing Act, FLPMA, Endangered Species Act, Clean Water Act (33 U.S.C. 1251 *et seq.*), and other relevant authorities. Where existing management practices fail to meet these national requirements, the BLM authorized officer would be required to take action as soon as practicable but not later than the start of the next grazing year. This would include actions such as reducing livestock stocking rates, adjusting the season or duration of livestock use, or modifying or relocating range improvements.

Standards and guidelines would be developed to provide further guidance, within the framework of the national requirements, in the administration of livestock grazing on public lands. BLM state directors, in consultation with the affected multiple resource advisory councils, would be responsible for identifying the appropriate geographical area for which standards and guidelines would be developed. Standards and guidelines would be developed for an entire state or for an ecoregion encompassing portions of more than one state. Standards and guidelines would not be prepared for a smaller area totally within the boundaries of a single state except where the BLM state director, in consultation with the multiple resource advisory councils, determines that the combination of the geophysical and vegetal character of an area is unique and the health of the rangelands within the area could not be adequately protected using standards and guidelines developed on a

broader geographical scale. The intent of this limitation on the geographical scope of standards and guidelines is to provide for the development and application of uniform standards and guidelines across an area including public lands of similar character. This limitation would result in more consistent application of standards and guidelines, and would encourage collaboration between BLM offices, multiple resource advisory councils, and the public in addressing the resource management needs and concerns of an area. Standards and guidelines could be developed for ecoregions involving public lands within more than one state for the purpose of ensuring the consistent application of rangeland management measurements and practices across an identifiable ecoregion.

The proposed action would establish guiding principles to be addressed in the development of standards and guidelines. The guiding principles represent what the Department has identified as the resource concerns and types of management practices that must be considered in the development of standards and guidelines. The guiding principles for the development of standards are intended to provide focus on riparian area function and the minimum soil and vegetation conditions required for rangeland ecosystem health. The guiding principles for the development of guidelines for grazing administration provide focus on the consideration of management practices that assist in or do not inhibit meeting certain legal mandates and achieving and maintaining rangeland health. Included in these guiding principles are the requirements that state or regional guidelines address: grazing practices to be implemented to benefit threatened or endangered species and candidate species, and to maintain, restore or enhance water quality; critical periods of plant growth or regrowth and the need for rest from livestock grazing; situations in which continuous season-long grazing, or use of ephemeral rangelands, could be authorized; the allowable types and location of certain range improvements and management practices; and utilization or residual vegetation limits.

The BLM state director, in consultation with multiple resource advisory councils, the interested public, and others, would be required to develop standards and guidelines that are consistent with the national requirements and the guiding principles. It is anticipated that there may be a need to add additional standards and



guidelines consistent with the national requirements to reflect the state or regional resources, the character of the public lands, local livestock management practices, and community interests. For example, state or regional guidelines may specify limitations on the season of livestock use or thresholds for utilization by livestock in crucial big game winter ranges. Multiple resource advisory councils, and their resource teams and technical review teams, would play an important role in designing standards and guidelines to meet conditions and concerns encountered within the specific state or region by facilitating open discussion and ensuring that the views of all interested parties are considered in preparing their recommendations for the BLM. The BLM would not implement state or regional standards or guidelines developed pursuant to the proposed action prior to their approval by the Secretary.

The proposed action includes a provision for fallback standards and guidelines that would become effective 18 months after the effective date of the final rule in the event that state or regional standards and guidelines are not complete. The fallback standards and guidelines would remain in effect until state or regional standards and guidelines are completed and approved by the Secretary.

The fallback standards are largely based on indicators of soil stability and watershed function, distribution of nutrients and energy, and the ability of plant communities to recover. The three categories of indicators, when considered in combination, have been found to be key in assessing rangeland health. The standards are generally based on the findings of the Committee on Rangeland Classification presented in "Rangeland Health" (National Research Council 1994) and BLM's Riparian Area Management (TR1737-9, Process for Assessing Proper Functioning Condition, 1993). A fourth fallback standard addresses indicators of healthy flood plain structure and condition, a critical component of healthy rangeland ecosystems and riparian systems.

The fallback guidelines would restrict management practices to those activities that assist in or do not hinder meeting certain legal mandates and achieving or maintaining rangeland health. The fallback guidelines include the requirement that grazing management practices be implemented that assist in or do not hinder the recovery of threatened or endangered spe-

cies, or assist in preventing the listing of species identified as candidates for threatened or endangered species. This guideline is intended to avoid the impacts associated with the listing of more species as threatened or endangered. A second guideline would require that grazing practices be implemented that would assist in attaining and protecting water quality consistent with the Clean Water Act. The fallback guidelines would also require that grazing schedules include periods of rest during times of critical plant growth or regrowth, and that continuous season-long grazing be limited to instances where it has been demonstrated that such use would be consistent with achieving or maintaining rangeland health and riparian functioning condition, and with meeting established resource objectives. Under the fallback guidelines, development of springs or other projects affecting water would be designed to protect the ecological values of the affected sites. Livestock management practices or management facilities such as corrals, pipelines, or fences, would generally be required to be located outside of riparian-wetland areas, and where standards for these areas are not being met, the facilities could be removed or relocated, or the management practices modified. The fallback guidelines would require the establishment and application of utilization or residual vegetation limits that would benefit the diversity and vigor of woody and herbaceous species, maintain healthy age-class structure in riparian-wetland and aquatic plant communities, and would leave sufficient biomass and plant residue to provide for sediment filtering, the dissipation of stream energy, and streambank stability and shading. Finally, the fallback guidelines would require that allotment management plans and other activity plans addressing livestock grazing that are developed or amended after the fallback guidelines become effective specify desired plant communities, including minimum percentages of site vegetation cover, and incorporate utilization limits for both riparian and upland sites to assist in achieving or maintaining proper functioning condition.

The Department recognizes that the proposed fallback standards and guidelines may not fit all situations. A provision has been included in the proposal that would allow BLM state directors to adjust the fallback standards and guidelines, subject to approval of the Secretary, to fit state or local conditions. However, in tai-



loring the fallback standards and guidelines to more local conditions, the BLM state directors must ensure that the general purpose of each of the fallback standards and guidelines is met.

The proposed national requirements, and all standards and guidelines, whether fallback, state, or regional would be implemented subject to NEPA (42 U.S.C. 4331 *et seq.*; NEPA) and applicable land use planning regulations. The national requirements and guiding principles for state and regional standards and guidelines are analyzed in this document. The fallback standards and guidelines are also analyzed. Any additional NEPA analysis required during development of state or regional standards and guidelines would tier to the analysis of national requirements and standards and guidelines presented in the final EIS for Rangeland Reform '94.

It is the Department's intent to develop state or regional standards and guidelines, complete plan conformance tests, and undertake necessary plan amendments within 18 months of the effective date of the final rule. Development of the state or regional standards and guidelines and any plan amendments that are necessary would occur simultaneously. Thus, state or regional standards and guidelines would be implemented as they are finalized and approved by the Secretary. If this has not occurred within 18 months of the effective date of the final rule, fallback standards and guidelines would be put in place until the state or regional standards and guidelines are completed. The Department envisions that all rangelands administered by the BLM under 43 CFR part 4100 would have enforceable standards and guidelines by the end of the 18-month period.

Implementation of the national requirements and the standards and guidelines for grazing administration would be accomplished by directing specific actions to promote or achieve the requirements and standards and guidelines. The specific actions needed to implement the requirements, standards, and guidelines would be incorporated in the terms and conditions of grazing permits and leases, and other grazing authorizations. Actions needed to implement the requirements, standards, and guidelines would also be incorporated in allotment management plans or other activity plans as they are prepared or amended.

The proposed action would require that the authorized officer specify terms and conditions that would ensure conformance with the na-

tional requirements, standards, and guidelines in all grazing leases and permits. These terms and conditions would be added at the time of permit or lease issuance, including the transfer or renewal of permits or leases. However, where the authorized officer determines that the national requirements or established standards and guidelines are not being met under existing terms and conditions, the terms and conditions of grazing permits and leases and other grazing authorizations would be modified as soon as practicable, but not later than the start of the next grazing year.

Reflecting the national requirements and standards and guidelines in the terms and conditions of grazing permits and leases would provide the management mechanism to help achieve, to the extent practicable, healthy rangeland ecosystems. While grazing administration may not be the only factor affecting the health of rangeland ecosystems, it is the Department's intent to ensure improvement in the context of grazing management through the standards and guidelines for grazing administration.

The Department intends that all high priority grazing allotments would be reviewed for the need to modify terms and conditions to ensure conformance with the national requirements, and standards and guidelines within three years of the effective date of the final rule. Priority would be based largely on the review of riparian area conditions. This review, in combination with incorporating terms and conditions reflecting the national requirements and standards and guidelines as permits and leases are issued, renewed or transferred, should ensure that a large portion of BLM grazing allotments would be protected by the national requirements and the standards and guidelines. The public is invited to provide comments and suggestions on the structure of the review of grazing allotments and the criteria for determining the priority of allotments to be reviewed.

## Alternatives to Consider

The National Environmental Policy Act (NEPA) regulations (40 CFR 1502.14) require rigorous exploration and objective evaluation of a range of alternatives, including those not within the jurisdiction of the agencies. The management and fee alternatives respond to significant issues identified during the scoping process and



present a range of alternatives for analysis, as required under NEPA.

The following rangeland management alternatives are presented:

- (1) Current Management (No Action)
- (2) BLM-Forest Service Proposal (Proposed Action)
- (3) Livestock Production
- (4) Environmental Enhancement
- (5) No Grazing

The following fee alternatives are presented:

- (1) Current Fee Formula as set by the Public Rangelands Improvement Act (PRIA) (No Action)
- (2) Modified PRIA
- (3) BLM-Forest Service Proposed Action
- (4) Regional Fees
- (5) Federal Forage Fee
- (6) PRIA with Surcharges
- (7) Competitive Bidding

Management and fee alternatives considered but not analyzed in detail are covered in Chapter 2.

## Key Issues

Issues relating to impacts to be addressed generally fell into one of five categories:

- Rangeland ecological conditions
- Resource use conflicts
- Social and economic issues
- Stewardship
- Agency practices

## Rangeland Ecological Conditions

Many respondents wanted to ensure that the EIS analyzed the benefits of livestock grazing in addition to harmful effects. The ranching industry believes that much good has resulted from livestock grazing and that the loss of livestock as a management tool could harm soil and vegetation. Comments also suggested that to determine the impacts of national standards and guidelines, the diversity of the 17 western states must be reflected by more detail on competing resources, goals that need to be set, and regional standards and guidelines. Some respondents also believed that the full impacts would not be known unless the Federal Government set up a way to monitor success. Other respondents wanted BLM and the Forest Service to focus management on the rangelands needing improvement, rather than proposing an overall rangeland reform.

## Resource Use Conflicts

The underlying opinion on use conflicts was that the EIS should analyze damage from all resource uses, not just grazing. This analysis would include such items as damage to riparian areas from wildlife versus livestock grazing. Respondents who considered ranchers to be stewards of the land believed that the EIS should analyze the potential for private landowners to restrict public access to federal land or to sell their property for subdivision and the effects of these actions on other resource users.

## Social and Economic Issues

Many respondents were concerned about the effect of Rangeland Reform '94 on their communities. Stating that decisionmaking should consider social and economic stability along with ecological effects, they recommended the EIS analyze impacts on such areas as the following:

- local tax base
- individual ranches
- loss of jobs



- western culture/customs
- consumers
- related industries
- communities
- counties
- states
- Nation
- tourism
- banks and FDIC

Many comments requested that the EIS analyze the impacts of private land dependency on federal lands. Respondents also expressed concern that the proposal would economically harm public land ranchers and would thereby decrease the number of ranchers whose livestock graze on federal land. Ranchers were concerned that the total impacts would result in a decrease of their net and discretionary incomes, and many feared physical and economic dislocation as a result. Other respondents stated that the changes in rangeland management policies would not greatly affect the number of ranchers who could continue in the public lands grazing business. They believed that the short-term economic needs of the livestock industry should not be placed above sound resource stewardship.

### Stewardship

Many respondents felt that good stewardship should lead to longer permit tenure and that shortening the length of permit tenure would provide a disincentive. Some respondents also believed the number of ranchers would decline, which would result in loss of wildlife habitat, recreation opportunities, access to federal land, and fire protection because ranchers have improved the management of these activities and resources.

### Agency Practices

Pervasive among the comments was the sentiment that the changes proposed under the

BLM-Forest Service Proposed Action would represent a taking of private property rights. Comments repeatedly emphasized the issue of takings. Also requested was an analysis of the impact to agency budgets if changes were implemented, as well as the workload impacts for agency staff. Respondents believed that significant staff increases would be required to carry out the goals of this reform proposal. Respondents also requested that the EIS analyze the administrative costs of such items as shorter permit tenure and probable increases in the number of appeals filed. Major concerns were also expressed about the provision for conservation use, which some respondents believed would result in large blocks of land being controlled by nongrazing, special interest groups. Suggested impacts to be analyzed included the potential for catastrophic wildfires and the loss of county revenue for lands in this status.

### Issues Not Addressed

This EIS does not address several issues raised during scoping. Suggestions considered beyond the scope of this document included requests for an overhaul of BLM's wild horse and burro program, inclusion of animal damage control and participation by state agencies, the U.S. Fish and Wildlife Service, Bureau of Indian Affairs, and the National Park Service. These suggestions are too broad and beyond the scope of an EIS specific to rangeland reform. Suggestions that did not meet the purpose and need for rangeland reform included requests that BLM establish an internal appeals process and that the agencies use rangeland improvement dollars to acquire land.

One comment requested that House Resolution No. 2638, "The Northern Rockies Ecosystem Protection Act of 1993" be considered. This bill was deemed to be outside the scope of this document because it deals with designating wilderness areas in the northern Rocky Mountains.

A proposal to have states or counties manage federal rangelands was not considered because it did not satisfy the fundamental purpose and need of improving federal agency administration through changes in the regulations.

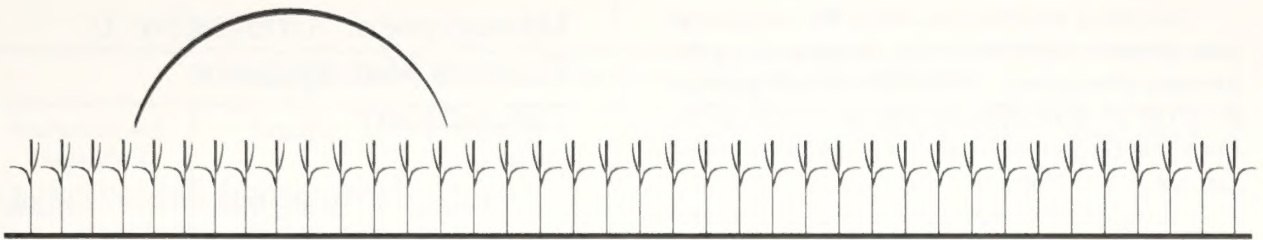
Also not considered were proposals that the Federal Government pay ranchers to graze their livestock or that public land be sold or given to federal permittees. One of the basic purposes

of rangeland reform is to receive a fair return for the use of public lands, a criterion that neither of these proposals would have satisfied. A suggestion that grazing fees be based on individual allotment appraisals was not considered because its administration would be complicated and inefficient.

BLM and the Forest Service considered each issue and concern raised during the scoping process for their relevance to the purpose and need. This EIS addresses the issues raised during the scoping process and gives the public another chance to review the Rangeland Reform '94 proposal and participate in the BLM and Forest Service decisionmaking processes.







# CHAPTER 2

## Description of Alternatives

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Chapter 2 describes in detail five rangeland management alternatives and seven grazing fee formula alternatives. These alternatives provide an array of management and fee formula options that respond to both the purpose and need and the issues listed in Chapter 1.

Management alternatives address management aspects other than fees of the BLM and Forest Service rangeland management programs, including standards and guidelines and 19 other elements of rangeland policy and regulations identified during agency reviews and scoping. Fee formula alternatives consist of different methods for setting grazing fees.

Thirty-five alternatives could be developed by combining the five management alternatives with the seven fee formulas. For clarity the five management alternatives and the seven fee formulas are presented separately in this chapter. But in Chapter 4, Environmental Consequences, each management alternative is combined with each of the seven fees, and the cumulative impacts are analyzed. Chapter 4 also includes an extensive analysis of a high (\$6.38), moderate (\$4.28), and low (\$1.86) fee combined with each of the management alternatives. (See analysis of impacts on economic conditions in Chapter 4 and the appendixes.)

## ***Management Alternatives***

Five management alternatives are analyzed in detail in this EIS:

- (1) Current Management (No Action)
- (2) BLM-Forest Service Proposed Action
- (3) Livestock Production (Increase livestock operator influence or control.)
- (4) Environmental Enhancement (Authorize livestock grazing only where it can be demonstrated that livestock grazing would not cause unacceptable conflicts with other resources.)
- (5) No Grazing

Other management alternatives were evaluated but eliminated from detailed analysis for reasons described later in this chapter.

## **Management Alternative 1: Current Management (No Action)**

The Current Management alternative would continue existing policies, regulations, and management practices. (Table 2-1 summarizes key elements of this alternative.)

### **National Requirements and Standards and Guidelines**

BLM now has no comprehensive national requirements or rangeland management standards and guidelines. Some BLM field offices have been establishing standards and guidelines or their equivalent to address local rangeland management concerns. Different BLM field offices managing lands contiguous with each other or the Forest Service have at times applied different standards even within the same ecosystem and when dealing with the same permittees.

The Forest Service has national rangeland management policy and objectives (see Appendix A) and establishes standards and guidelines for rangeland management in national forest land and resource management plans.

### **Rangeland Program Administration**

The regulations that direct BLM and the Forest Service in administering their rangeland programs are found in 43 CFR 4100 for BLM and 36 CFR 222 for the Forest Service. The objectives of these regulations are to protect rangeland resources, to allow for the orderly use of rangeland, and to enable improvement of the federal lands. These goals have not been consistently met under current regulations and management. Current management does not meet the purpose and need described in Chapter 1. Current regulations include the following elements.

#### ***Leasing***

To qualify for a grazing permit, BLM requires that permittees own or control (rent or lease) both livestock and base property. BLM regulations allow the leasing of base property





**Table 2-1: Key Elements of the Current Management Alternative**

<b>Standards and Guidelines</b>	<b>Leasing</b>	<b>Foreign Corporations</b>	<b>Disqualification</b>	<b>Prohibited Acts</b>	<b>Grant Policy</b>
<b>BLM-No FS-Yes</b>	<b>BLM-Own or control FS-Requires ownership</b>	<b>BLM-U.S. citizen or licensed to conduct business in state FS-U.S. citizen or corp. 80% owned by U.S. citizens</b>	<b>BLM-None FS-None</b>	<b>BLM-Bald Eagle Protection Act and ESA violations FS-Broad range of conditions</b>	<b>BLM-Prioritized; no performance criteria FS-Some criteria applied</b>
<b>Permit Tenure</b>	<b>Unauthorized Use</b>	<b>Nonuse</b>	<b>Suspended Nonuse</b>	<b>Water Rights</b>	<b>Range Improvement Ownership</b>
<b>BLM-10 yrs. FS-10 yrs.</b>	<b>BLM-Three-tiered fee formula; no incidental use FS-Two types, one fee; incidental use</b>	<b>BLM-Year-to-year, or for 2 yrs. after decision FS-Up to 3 yrs. personal; up to term of permit for resource protection</b>	<b>BLM-Carry on permit FS-None</b>	<b>BLM-Mixed ownership subject to state law FS-Federal ownership subject to state law</b>	<b>BLM-Mixed FS-Federal</b>
<b>Range Betterment Fund Distribution</b>	<b>Unauthorized Use</b>	<b>Nonuse</b>	<b>Suspended Nonuse</b>	<b>Water Rights</b>	<b>Range Improvement Ownership</b>
<b>BLM-1/2 district of origin, 1/2 Secretarial discretion FS-1/2 forest of origin, 1/2 regional forester discretion</b>	<b>BLM-Engineer &amp; build FS-Plan &amp; build</b>	<b>BLM-Auto. stay upon appeal; full force &amp; effect for resource protection FS-No auto. stay upon appeal for permit admin. decisions</b>	<b>BLM-Yes FS-No</b>	<b>BLM-Charges to cover processing FS-Fee for split billing</b>	<b>BLM-No regs. FS-No regs.</b>

2-3

and the later transfer of grazing privileges to qualified applicants.

BLM regulations now recognize only two legitimate types of private leases or agreements affecting public land grazing privileges. The first type is a base property lease and transfer of the federal grazing permit. In a base property lease, a federal grazing permittee leases private base property to another party, and upon BLM's approval, the federal permit is transferred to the base property lessee for the term of the lease.

The second type of private lease is a management lease, also called a pasturing contract or agreement. Under a management lease, BLM may authorize a federal grazing permittee to allow a second party's livestock to graze on pub-

lic lands when the current permittee manages the livestock under the terms of the existing permit. For such leases, permittees must certify that they control the livestock that will graze on their allotments. These two allowable types of private leases are not included in the regulatory definition of "subleasing" which is prohibited.

Subleasing is not allowed. Under current regulations, subleasing is an illegal act in which permittees agree either (1) sublease part of the allotment where second party does not control base property to allow a second party to graze livestock on the public lands where the permittee does not manage the livestock and the second party does not control the base property



supporting the permit or lease, or (2) to allow livestock they do not own or control to graze on public lands. Subleases usually earn permittees a profit because the amounts permittees receive from them exceed the amounts they pay for their BLM leases.

The Forest Service requires permittees to own both the livestock grazed and the base property. Private leasing arrangements are not allowed.

### ***Foreign Corporations***

BLM currently requires that a permittee be a U.S. citizen or a corporation licensed to conduct business in the state it wants to graze in. The Forest Service requires that a permittee be a U.S. citizen or a corporation that is at least 80 percent owned by U.S. citizens.

### ***Disqualification***

Neither agency's current regulations allow a permittee or applicant to be disqualified from applying for or holding a permit because of misconduct or bad performance on another permit.

### ***Prohibited Acts***

BLM can cancel grazing permits for violations of the Bald Eagle Protection Act and the Endangered Species Act. Permittees who violate other laws that protect federal resources may be subject to civil or criminal penalties but not to the loss of their permits.

The Forest Service can cancel grazing permits when a permittee is convicted of violating federal or state environmental laws related to the grazing use authorized by the permit.

### ***Grant Policy***

BLM's current policy when authorizing grazing permits for "new" or unallocated forage, vacant allotments, or newly acquired public land is to give priority to existing BLM permittees in proportion to their contributions or efforts resulting in the increased forage, or in proportion to their grazing preference that has been in suspended nonuse. If these priorities have been met or do not apply, BLM considers applicant qualifications for a permit, the need for the land in the ranch operation, and what operation would

best administer the land and meet management objectives for the allotment. BLM does not currently consider past performance in complying with permit terms as a criterion.

The Forest Service has similar criteria for granting grazing privileges, but livestock permittee performance (management of current or prior grazing allotments) is not a primary consideration.

### ***Permit Tenure***

BLM and Forest Service grazing permits are issued for 10 years, except when (1) the land is pending disposal, (2) the land will be devoted to a public purpose that precludes a 10-year period, or (3) a shorter term is in the interest of sound resource management. Both agencies typically issue permits for the full 10-year period. Neither agency issues grazing permits for periods shorter than 10 years solely on the basis of an operator's performance.

### ***Unauthorized Use***

Sometimes called trespass, unauthorized use refers to use by livestock without agency authorization or contrary to the terms of a BLM or Forest Service grazing permit. BLM uses a three-tiered formula when assessing fines for unauthorized use:

- (a) Nonwillful: The average commercial grazing lease rate published by the National Agricultural Statistical Service (NASS) in the most recent June Enumerative Survey for the 11 western states. (In 1993 this rate was \$9.41 per AUM.)
- (b) Willful: Double the average commercial grazing lease rate.
- (c) Repeated Willful: Three times the average commercial grazing lease rate.

Incidental use is inadvertent unauthorized use that results in little or no resource damage. Currently BLM does not recognize this concept and must deal with incidental use as nonwillful unauthorized use, penalizing the permittee although no damage occurred.

The Forest Service recognizes two types of unauthorized grazing, excess use and unautho-



rized use. Excess use is livestock use associated with a Forest Service grazing permit but outside the permitted area, season, or numbers. Excess use violates the conditions of the grazing permit and may result in the associated grazing permit being wholly or partly canceled or suspended (36 CFR 222.4(4)). In addition, the Forest Service charges for excess use at the same rate (average commercial grazing lease rate) that BLM imposes under its current definition of nonwillful unauthorized use.

Unauthorized use is livestock use that is not authorized by or related to the use of any Forest Service grazing permit (with exceptions listed in 36 CFR 261.2) on Forest Service-administered lands. Unauthorized use is a prohibited act (36 CFR 261.7) and may be punished by fine or imprisonment (36 CFR 261.1b). In addition, the Forest Service may charge for forage consumed at the same rate as described for excess use.

### ***Nonuse***

Current regulations allow BLM managers to approve or disapprove annual applications for nonuse. Nonuse occurs when all or a portion of the forage allowed for livestock under an approved permit is left unused for economic, resource protection, or other reasons. If the authorizing officer determines that all or part of the forage allowed for livestock must be used and after 2 years the permittee has not used the forage, the permit can be canceled.

On an annual basis, the Forest Service may now authorize up to 3 years of nonuse for an operator's personal convenience or multiple years of nonuse for resource protection. Either the Forest Service or permittees of Forest Service-administered land can initiate negotiations to keep livestock off an allotment for resource protection. The final decision, however, resides with the Forest Service.

### ***Suspended Nonuse***

Current BLM regulations allow for a permittee's grazing preference to be held in two ways: in active use and in suspended nonuse. Active use is the amount of currently authorized livestock grazing use, based on the amount of forage expressed in animal unit months (AUMs) available for livestock grazing. The proper level of active use is generally determined through land use planning. Suspended nonuse is a term

used for forage that at one time livestock could graze but that was later suspended from grazing by a decision or mutual agreement because the allotment did not grow enough forage to allow that much grazing. A permittee does not pay for AUMs held in suspended nonuse, but some banks lend money against the total amount of grazing preference (active and suspended) shown on the permit. Suspended nonuse is rarely converted to active use.

The Forest Service has no suspended nonuse category in its permitting process.

### ***Water Rights***

Both agencies recognize the key role of the states in grazing-related water rights issues. Since the 1980s, BLM policy has been not to apply for water rights for grazing purposes (this policy was not universally applied). Generally, both agencies apply for rangeland improvement water rights under state law and protest private applications for water rights on lands they administer, although in some cases BLM does not. Where permittees and BLM complete water developments under cooperative agreements, BLM sometimes files as co-owner of the water rights. Where permittees finance the entire water development on BLM-administered land, they may file for sole ownership of the water right. The Forest Service files for sole ownership of the water right where permitted by state law whenever livestock water is developed on National Forest System lands.

### ***Range Improvement Ownership***

BLM grazing permittees may be authorized to install range improvements through range improvement permits. Under this type of authorization, permittees fund and are granted sole ownership of the improvements.

BLM and the Forest Service also complete range improvement projects in cooperation with livestock permittees. The agencies cooperate with grazing permittees to provide labor, equipment, and/or materials to build the project. In such cases, the agencies and the permittee develop a cooperative agreement that outlines responsibilities for building and maintaining the improvement. The agencies retain ownership of range improvements completed under cooperative agreements.



The Federal Government owns all permanent range improvements on Forest Service-administered land.

### ***Range Betterment Fund Distribution***

The Range Betterment Fund consists of the money collected from federal land grazing fees that is to be used for rangeland improvement.

Half of BLM grazing receipts are returned to BLM for range improvements. Half of these receipts (25 percent of total fees) are returned to the BLM district of origin. The Secretary of the Interior then can allocate the other half (25 percent of total receipts) to any BLM field office as long as over a 5-year period each district receives an average of 50 percent of its total receipts from grazing fees. Normally BLM returns the entire 50 percent to the district of origin each year. Of the remaining 50 percent, 12.5 percent of fees from permits (Section 3 lands) and 50 percent of fees from leases (Section 15 lands) are returned to the state of origin. The remaining receipts from permits go to the U.S. Treasury.

Under Forest Service regulations, half of grazing receipts are returned to the Forest Service to be distributed to the region of origin, with regional foresters being able to assign half of that (25 percent of total receipts) to any forest within their region. The remaining 25 percent goes to the originating forest. Typically, however, the entire 50 percent is returned to the national forest of origin. The other 50 percent of Forest Service receipts go to the U.S. Treasury. Half of those receipts, or 25 percent of total grazing receipts, are disbursed to the counties of origin for roads and schools.

### ***Range Betterment Fund Use***

BLM currently uses Range Betterment Funds solely for labor, materials, and final survey and engineering of range improvement projects. Project planning, preliminary design, environmental review, and contract preparation must come from other funding sources. The Fiscal Year 1992 appropriations bill gave BLM a one-time use of some Range Betterment Funds for project planning for that fiscal year.

The Forest Service uses Range Betterment Funds for specific design, planning and building rangeland improvements.

### ***Appeals***

Under current BLM grazing regulations in 43 CFR 4160, appealed grazing decisions are automatically stayed—the implementation of such decisions is deferred—until appeals are resolved. But in an emergency the authorized officer can place such decisions in full force and effect to stop resource deterioration. The time needed to resolve appeals often extends up to 2 years or longer, whereas decisions placed in full force and effect take effect on the date specified in the decision, pending resolution of the appeal. The 43 CFR 4160 regulations conflict with the recently revised general provisions of 43 CFR 4.21, under which decisions automatically become effective after (at most) 75 days, unless a stay is granted by the Office of Hearings and Appeals upon a motion by the affected party.

Forest Service regulations do not allow a decision on the occupancy or use of National Forest System land under appeal to be automatically deferred or stayed (36 CFR 251.91). Decisions made under NEPA have an automatic 45-day stay if appealed (36 CFR 215). The appeal, however, must be resolved within the 45-day period.

### ***Grazing Advisory Boards***

Grazing advisory boards were authorized by the Federal Land Policy and Management Act of 1976, but this provision of the Act expired on December 31, 1985, and has not been renewed. Under the Federal Advisory Committee Act and the implementing regulation in 41 CFR 101-6.10, the National Forest Management Act of 1976, and the Food and Agriculture Act of 1977, BLM and the Forest Service can continue to set up boards reflecting a variety of viewpoints and resource interests to give advice on rangeland management.

The Forest Service does not now use grazing advisory boards. Although the provision of FLPMA authorizing grazing advisory boards expired in 1985, the Forest Service regulation authorizing these boards is still on the books. The Forest Service may use resource advisory boards to provide input into forest planning. Additionally, all interested individuals and state, county, and federal agencies are allowed to participate in forest planning and project decisions in accordance with NFMA and NEPA.



BLM reestablished grazing advisory boards in response to a Secretarial notice of May 14, 1986. Grazing advisory boards advise BLM field offices on livestock grazing-related questions that arise in preparing activity plans and spending Range Betterment Funds. Such boards consist of five to eight members, who are permittees or lessees elected by their peers. Typically the areas represented by BLM grazing advisory boards conform to district office administrative boundaries. In some states, grazing advisory boards also administer and distribute grazing fee receipts returned to the states and counties. This function is authorized by the states, not by federal regulations.

### *Service Charge/Transaction Fee*

BLM grazing regulations require a \$10 service charge for each crossing permit, transfer of grazing preference, and replacement or supplemental billing notice, except for actions initiated by the authorizing officer. The Forest Service charges \$35 under some circumstances if a permittee wants to split a billing period but no fee for the routine paperwork of administering a grazing permit.

### *Rangeland Ecosystems*

Both BLM and the Forest Service manage rangeland ecosystems, but administration is broken up according to forest, resource area, district and state lines. Both agencies are engaged in an ongoing effort to establish more rigorous, coordinated, ecologically based policies and procedures to carry out their multiple use and sustained yield mandates. But neither BLM nor the Forest Service has regulations specifically addressing the use of an ecosystem approach to managing rangelands.

### *Special Status Species*

Both BLM and the Forest Service are committed to managing for the recovery of threatened and endangered species and their habitats. Agency policies and the Endangered Species Act require the use of all methods and procedures

needed to bring all species and their habitats to a point of recovery where the provisions of the Endangered Species Act are no longer required.

Policy requires that BLM and the Forest Service ensure that actions authorized, funded, or carried out do not contribute to the need to list a sensitive species as threatened or endangered. Furthermore, BLM and the Forest Service will carry out management in a manner that promotes the conservation of candidate species and their habitats by the use of all methods and procedures needed to remove threats to their continued existence or habitats. BLM and Forest Service have policies requiring cooperation with all state and federal agencies when it is determined that a special status species may be affected by a proposed action.

Subsequent actions under Current Management that might affect federally listed species or their designated critical habitats would be subject to formal consultation with the Fish and Wildlife Service or the National Marine Fisheries Service pursuant to Section 7 of the Endangered Species Act. Similarly, conferences will be conducted for species that are proposed for federal listing. For purposes of impact analysis on a large scale, federally listed species affected by livestock grazing in the study area, will be treated in this EIS as though significantly affected by the alternatives.

BLM and Forest Service will consult on all actions tiered to this document as discussed in this chapter. This tiered development of implementation actions requires that analysis of the effects of those actions that might affect Endangered Species Act compliance be completed as part of developing each implementation plan. Under Current Management, the agencies would continue their trend toward developing plans and consultations on a species rangewide or ecosystem-wide basis. Neither this document nor its biological opinions from the Fish and Wildlife Service and the National Marine Fisheries Service are intended to replace any part of the requirements under Section 7 of the Endangered Species Act for consultation on actions developed at the regional level that might affect federally listed species



## Management Alternative 2: BLM-Forest Service Proposed Action

Alternative 2 is the Proposed Action of BLM and the Forest Service, which would respond to the purpose and need described in Chapter 1 by changing many elements of the agencies' current rangeland policies, regulations, and management practices. (Table 2-2 summarizes key elements of this alternative.) The Proposed Action includes national requirements that provide the basis for developing state or regional standards and guidelines for managing livestock grazing in rangeland ecosystems administered

by BLM. The Proposed Action would also establish more consistent BLM and Forest Service management programs to improve ecological conditions while maintaining opportunities for long-term sustainable development. The proposed fee formula would obtain for the public a fair payment for grazing livestock on public land. See Proposed Rule for more detailed information regarding this alternative.

### National Requirements and Standards and Guidelines

Under the Proposed Action, BLM would adopt and implement national requirements for

**Table 2-2: Key Elements of the Proposed Action**

Standards and Guidelines	Leasing	Foreign Corporations	Disqualification	Prohibited Acts	Grant Policy
BLM-Yes FS-Yes	BLM-Own or control; add surcharges (except for sons and daughters) FS-Requires ownership	BLM-U.S. citizen or licensed to conduct business in state FS-U.S. citizen or licensed to conduct business in U.S.	BLM-Can't apply for permit if any are canceled within last 3 yrs. FS-Can't apply for permit if any are canceled within last 3 yrs.	BLM-Broad range of conditions FS-Broad range of conditions	BLM-Adds performance criteria FS-Adds performance criteria
Permit Tenure	Unauthorized Use	Nonuse	Suspended Nonuse	Water Rights	Range Improvement Ownership
BLM-10 yrs. FS-10 yrs.	BLM-Three-tiered fee formula; nonmonetary settlement FS-Three-tiered fee formula; nonmonetary settlement	BLM-Up to 3 yrs. personal; up to 10 yrs. resource protection FS-Up to 3 yrs. personal; up to 10 yrs. resource protection	BLM-Carry on permit FS-None	BLM-Federal ownership of new water rights, subject to state law FS-Same as BLM	BLM-Federal FS-Federal
Range Betterment Fund Distribution	Range Betterment Fund Use	Appeals	Grazing Advisory Boards	Service Charge/Transaction Fee	Rangeland Ecosystems
BLM-1/2 district of origin, 1/2 state director discretion FS-1/2 forest of origin, 1/2 regional forester discretion	BLM-Plan, engineer, build, & environmental assessment FS-Plan, engineer, build, & environmental assessment	BLM-No automatic stay upon appeal FS-No automatic stay upon appeal for permit administration decisions	BLM-Replace w/ resource advisory councils FS-No	BLM-Charges to cover processing, including conservation use FS-Charges to cover processing	BLM-Regs.; policy implemented thru national requirements and regional standards and guidelines FS-In regs



public rangelands and state or regional standards and guidelines to assure that livestock grazing is conducted consistently and in accordance with proven principles already being successfully applied in rangeland ecosystems. Standards and guidelines would be aimed at maintaining and restoring ecosystem health. Management practices that diminish ecosystem health would be modified or eliminated, and activities promoting ecosystem health would be implemented. Information contained in the National Research Council report (National Research Council, 1994) was considered in developing the proposed direction for development of state or regional standards and guidelines.

BLM would implement standards and guidelines in a variety of ways. For example, some standards and guidelines would be implemented through design and contract specifications for range improvements. Others would be implemented through terms attached to grazing permits and related authorizations for the next grazing year. Failure to comply with such terms could result in a permit being canceled; grazing systems, stocking levels, or seasons of use being modified; or other changes being made.

Some areas may require total rest from livestock grazing until desired resource conditions are reached. Where an area is not progressing toward meeting desired conditions, BLM would immediately act to correct the situation before the next grazing season.

State or regional standards and guidelines would be prepared to ensure that management of livestock grazing is sensitive to the resources of specific ecoregions. These state or regional standards and guidelines would be incorporated into BLM resource management plans following completion of needed NEPA analyses and documentation. State or regional standards and guidelines would not normally be developed for areas smaller than a state. If conditions warrant more local standards and guidelines, they would be developed to supplement state or regional standards and guidelines. Local standards and guidelines would not supersede state or regional standards and guidelines.

The Forest Service formulates standards and guidelines for rangeland management, including livestock grazing, while preparing national forest land and resource management plans (forest plans) for each national forest and grassland. The Proposed Action would require that these forest plan standards and guidelines, and stan-

dards and guidelines from site-specific NEPA project decisions be made part of the conditions of term grazing permits. If no forest plan has been prepared or a plan lacks standards and guidelines for livestock grazing and no project decision has been made, a temporary permit would be issued for up to 3 years until the forest plan is completed or project decision is issued. Failure to comply with forest plan standards and guidelines would violate the conditions of the grazing permit and could result in livestock numbers being reduced or grazing permits being canceled.

### *Definitions*

The following definitions, standards, and guidelines would apply to all BLM lands used for livestock grazing:

**Properly functioning uplands:** Uplands function properly when vegetation and ground cover maintain soil conditions that can sustain natural biotic communities. The functioning condition of uplands results from the interaction of geology, soil, climate, water, biological activity, and landform.

**Nonfunctioning uplands:** Uplands are nonfunctioning when vegetation and ground cover are not maintaining soil conditions that can sustain natural biotic communities.

**Uplands functioning but susceptible to degradation:** These areas function properly, but because of livestock grazing or related management practices, the capability of vegetation or soil conditions to sustain natural biotic communities is threatened.

**Properly functioning riparian-wetland areas:** Riparian-wetland areas are functioning properly when enough vegetation, landform, or large woody debris is present to dissipate the stream energy from high waterflows and thereby reduce erosion and water quality; filter sediment, capture bedload, and aid floodplain development; improve floodwater retention and groundwater recharge; develop root masses that stabilize streambanks against cutting; develop diverse ponding and channel characteristics to provide the habitat and water depth, duration, and temperature needed for fish production, waterfowl



breeding, and other uses; and support greater biodiversity. The functioning condition of riparian-wetland areas is a result of interaction among geology, soil, water, vegetation, and animals.

**Nonfunctioning riparian-wetland areas:** Riparian-wetland areas that clearly are not providing adequate vegetation, landform, or large woody debris to dissipate the stream energy of high flows and are thus not reducing erosion, improving water quality, and functioning as described above. The absence of physical attributes such as a floodplain where one should be is an indicator of nonfunctioning condition.

**Wetland-riparian areas that are functioning but susceptible to degradation:** Riparian-wetland areas that are in functioning condition but have a soil, water, or vegetation attribute making them susceptible to degradation.

### ***National Requirements for Grazing Administration***

Grazing-related plans and activities on public lands would incorporate, as applicable, the following:

- (1) grazing practices that maintain or achieve healthy, properly functioning ecosystems;
- (2) grazing practices that enhance or maintain properly functioning riparian systems;
- (3) grazing practices that maintain, restore or enhance water quality and result in water quality that meets or exceeds State water quality standards will be implemented; and
- (4) grazing management practices that assist in the maintenance, restoration or enhancement of the habitat of threatened or endangered, and Category 1 or 2 candidate species.

When management practices do not meet the requirements of this section or the standards and guidelines, the authorized officer would take appropriate action before the start of the next grazing year.

### ***Standards and Guidelines for Grazing Administration***

BLM state directors would be responsible for the development of standards and guidelines for grazing administration for the states or regions under their jurisdiction. In consultation with multiple resource advisory councils, each state director would determine the appropriate geographical area for which such standards and guidelines would be developed and implemented.

Standards and guidelines would be developed for an entire state, or for an ecoregion encompassing portions of more than one state, except where the state director determines that the combination of the geophysical and vegetal character of an area is unique and the health of the rangelands within the area would not be adequately protected using standards and guidelines developed on a broader geographical scale. The state director would consult with the multiple resource advisory councils, where they exist, in making these determinations.

The BLM state director would provide the opportunity to the public for involvement in the development of state or regional standards and guidelines.

State or regional standards and guidelines, and, local standards and guidelines where they are determined by the authorized officer to be appropriate, would be developed or amended in consultation with BLM multiple resource advisory councils, Indian tribes, and other federal land management agencies responsible for the management of lands and resources within the region or area under consideration, and the interested public.

At a minimum, state or regional standards for rangeland health would address indicators of the following:

- (1) soil stability and watershed function;
- (2) the distribution of nutrients and energy;
- (3) plant community recovery mechanisms; and
- (4) riparian functioning condition.



At a minimum, state or regional guidelines for grazing administration would address the following:

- (1) Grazing management practices to be implemented to assist the recovery of threatened or endangered species, and prevent species listed as Category 1 or 2 from becoming threatened or endangered.
- (2) Grazing management practices to be implemented to maintain, restore or enhance water quality, and result in water quality which is necessary to meet or exceed State water quality standards.
- (3) Periods of critical plant growth and re-growth and the need for, and the general timing and duration of, periods of rest from livestock grazing.
- (4) Situations in which continuous season-long grazing would be consistent with achieving properly functioning ecosystems and riparian systems.
- (5) Selection criteria and general design standards for the development of springs, seeps, and other projects affecting water and associated resources, that will protect the ecological values of those sites.
- (6) Situations in which grazing will be authorized on designated ephemeral (annual and perennial) rangelands, including the establishment of criteria for minimum levels of production, minimum residual growth to remain at the end of the grazing season, and the protection of perennial vegetation.
- (7) Criteria for the protection of riparian-wetland areas, including the location, or need for relocation or removal, of livestock management facilities (corrals or holding facilities, wells, pipelines, fences) outside riparian-wetland areas, or the modification of livestock management practices (for example, salting and supplement feeding).

(8) Grazing management practices or utilization or residual vegetation limits in riparian and wetland areas that will:

- (i) Maintain, improve, or restore both herbaceous and woody species (where present or potential exists) to a healthy and vigorous condition and facilitate reproduction and maintenance of different age classes in the desired riparian-wetland and aquatic plant communities; and
- (ii) Leave sufficient vegetation biomass and plant residue (including woody debris) to provide for adequate sediment filtering and dissipation of stream energy, streambank stability and stream shading.

In the absence of state or regional standards, and 18 months after the effective date of the final rule, the authorized officer would take appropriate action where a preponderance of evidence indicates that the following standards are not being met:

- (1) The soil A-horizon is present and unfragmented, and the soil is developed or accumulating on site. Rills and gullies are absent, or if present, they have blunted and muted features. There is no visible scouring, sheet erosion, and/or soil sediment deposition.
- (2) Plants are well distributed across the site, and photosynthetic activity occurs throughout the growing season. A uniform distribution of litter is evident. The plant community structure results in rooting throughout the available soil profile.
- (3) Plants display normal growth forms and vigor. The plant communities display a complete range of age classes.
- (4) Flood plains are present and well developed and channel sinuosity, width-to-depth ratio, and gradient are in balance with the landscape setting.



In the absence of the completion of state or regional guidelines within 18 months after the effective date of the final rule, the authorized officer would ensure that all grazing-related activities conform with the following:

- (1) Grazing management practices will ensure to the extent practicable the recovery of threatened or endangered species, and prevent candidate species, Category 1 or 2, from becoming threatened or endangered. Emphasis will be toward maintaining or improving plant and animal habitat to avoid future listing.
- (2) Grazing practices will maintain, restore or enhance water quality and assist in the attainment of water quality which meets or exceeds State standards.
- (3) Grazing schedules will include periods of rest during times of critical plant growth or regrowth. The timing and duration of rest periods will be determined by the local authorized officer administering the grazing authorization.
- (4) Continuous season-long grazing will be authorized only when it has been demonstrated to be consistent with achieving healthy, properly functioning condition and meeting identified resource objectives.
- (5) Development of springs and seeps or other projects affecting water and associated resources will be designed to protect the ecological values of those sites.
- (6) Grazing will be authorized on designated ephemeral (annual and perennial) rangeland only if reliable estimates of production have been made, an identified level of annual growth or residue to remain on site at the end of the grazing season has been established, and adverse effects on perennial species will be avoided.
- (7) Livestock management facilities (corrals or holding facilities, wells, pipelines, fences) or livestock management practices (salting and supplement feeding)

will be located outside riparian-wetland areas wherever possible. Appropriate action, which may include the relocation or removal of the facilities or modification of the practices, will be taken where standards are not being met.

- (8) Grazing management practices and utilization or residual vegetation limits will be established and applied in riparian and wetland areas that will:
  - (i) Maintain, improve, or restore a diversity of both herbaceous and woody species (where such species are present or would be present under normal conditions) to a healthy and vigorous condition and facilitate reproduction and maintenance of different age classes in the desired riparian-wetland and aquatic plant communities; and
  - (ii) Leave sufficient vegetation biomass and plant residue (including woody debris) to provide for adequate sediment filtering and dissipation of stream energy, streambank stability and stream shading.
- (9) Allotment management plans and other activity plans addressing livestock grazing that are developed or amended more than 18 months after the effective date of the final rule, will specify desired plant communities that will include minimum percentages of site vegetation cover, and will establish utilization limits for riparian and upland sites that will contribute to maintaining or achieving proper functioning condition.

Standards and guidelines provided above could be modified by the responsible BLM state director, following approval by the Secretary, to address local ecosystems and management practices.

No State or regional standards or guidelines developed by the BLM state director pursuant to this section shall be implemented prior to their approval by the Secretary.

Standards and guidelines developed or implemented would be adhered to in the development of grazing-related portions of activity



plans, and would be reflected in the terms and conditions of grazing authorizations. Where existing management practices fail to meet the applicable standards and guidelines, the authorized officer would take appropriate action prior to the start of the next grazing year.

## **Rangeland Program Administration**

### ***Leasing***

In response to concerns that permittees who enter into private leases or agreements are unduly benefiting from their permits, BLM under the Proposed Action would collect surcharges for leases and agreements involving federal grazing.

BLM would continue to allow base property leases and the transfer of grazing preference and permits, but transfers for the most part would have to be for at least 3 years. If BLM approves the transfer of a grazing permit attached to the base property, then the lessee would become the new BLM permittee. A 20 percent surcharge per federal animal unit month (AUM) would be assessed for all grazing permits that operate under a base property lease.

Permittees also would be allowed to enter into agreements to pasture another person's livestock (management lease) if they show proof of control (formal agreement transferring control), but BLM would assess a 50 percent surcharge per federal AUM for all livestock authorized under a pasture agreement. No agreement would be needed for sons and daughters, nor would a surcharge be applied. For permits using a base property lease and a pasture agreement for the same land, the surcharge would amount to 70 percent per federal AUM. Levied as a percent of BLM's grazing fee, the surcharges are proposed as an efficient way for BLM to collect a landlord's share of the lease or management fee without the added administrative costs of accounting, processing, and enforcing these arrangements.

The Forest Service is not proposing surcharges because leasing is not authorized. Under the Proposed Action, as under Current Management, Forest Service permittees would have to own both livestock and base property to qualify for a term grazing permit except as authorized in the eastern states. Children of a Forest Service permittee may run up to 50 percent

of their parent's permit under specified conditions.

### ***Foreign Corporations***

Current BLM policy allows foreign interests or corporations licensed to conduct business in the state in which grazing use is sought to hold grazing permits or licenses. BLM's policy would not change under the Proposed Action. Forest Service policy would change from currently requiring U.S. citizenship or being a corporation with at least 80 percent of its owners being U.S. citizens to the current BLM policy.

### ***Disqualification***

The Proposed Action would limit the provision for disqualification on the basis of cancellation of grazing permits during the preceding 36 months to applications for new or additional permits and leases. Also, consideration of an applicant's history of compliance with the terms and conditions of State permits and leases has been limited to state permits and leases within the boundary of the federal grazing allotment for which application has been made. Cancellation of such state permits or leases within 36 months prior to application would disqualify applicants for new or additional federal permits or leases. Partial suspension of a federal grazing permit or lease would not be grounds for disqualification. The consideration of an applicant's history of performance on other federal or state grazing permits or leases would not apply to applicants for the renewal of a BLM grazing permit or lease.

The Forest Service would not issue grazing permits to applicants whose federal grazing permits have been canceled in whole due to violations of laws, regulations, or conditions during the 36 months preceding the application.

### ***Prohibited Acts***

For BLM the Proposed Action would redefine prohibited acts to include violations of not just the Endangered Species Act and Bald Eagle Protection Act, but also the Wild Horse and Burro Act and other federal or state laws or regulations concerning, among other things, conservation or protection of natural and cultural resources or environmental quality when public



lands are involved or affected. The proposal would include procedures in BLM regulations before 1984 and would make BLM and Forest Service regulations more consistent. After conviction or an administrative finding of violation by a permittee, the authorized officer could cancel or suspend a grazing permit if public lands are involved or affected and no further appeals of the conviction or determination are outstanding. The following are examples of prohibited acts:

- Molesting, harassing, injuring, poisoning, or causing death of livestock authorized to graze on these lands and removing authorized livestock without the owner's consent.
- Interfering with lawful uses or users, including obstructing free transit through or over public lands by force, threat, intimidation, signs, barriers, or locked gates.
- Violating state livestock laws or regulations relating to the branding of livestock; breed, grade, and number of bulls; health and sanitation requirements; and laws regarding the straying of livestock from permitted public land grazing areas that have been formally closed to open range grazing through the application of state, county or local laws.
- Violating federal or state laws or regulations concerning pest or predator control and conservation or protection of natural and cultural resources or the environment where public lands are involved or affected, including the following:
  - Placing poisonous bait, traps, or hazardous devices designed to destroy wildlife without authorization;
  - Applying or storing pesticides, herbicides, or other hazardous materials without authorization;
  - Altering or destroying natural stream courses without authorization;
  - Polluting water sources;

- Illegal taking or destroying, or aiding in the illegal taking or destroying of fish and wildlife; and
- Illegal removing or destroying of archeological resources.

Current Forest Service policy would not change. The Forest Service would cancel or suspend a grazing permit when a permittee is convicted of violating federal or state environmental laws related to authorized grazing on the permit.

#### ***Grant Policy***

Under the Proposed Action, Forest Service policy and BLM regulations would be changed to add a new criterion for issuing grazing permits for "new" or unallocated forage to operators who have proven their ability to improve or maintain the condition of rangeland ecosystems.

#### ***Permit Tenure***

The Proposed Action would retain current provisions for permit tenure. As under current regulations, ten-year term grazing permits would be issued to permittees who meet the criteria for holding a term grazing permit. A permittee who refuses to accept the conditions of an offered permit would not be authorized to graze livestock on federal lands. This is also unchanged from current regulations.

#### ***Unauthorized Use***

The Proposed Action would allow nonmonetary settlements where unauthorized use is clearly unintentional and incidental and causes no resource damage, and where no substantial forage is consumed. This change would be consistent with Government Accounting Office findings and recommendations (GAO 1990). The three categories of fines described for Current Management would be retained.

The Forest Service would replace its term "excess use" with BLM's term "unauthorized use" and would also adopt BLM's three levels of financial penalties for unauthorized use—nonwillful, willful, and repeated willful. Under the Proposed Action, both agencies would



define unauthorized use and apply financial penalties consistently.

### ***Nonuse***

The Proposed Action would address BLM's authority to allow conservation use. Currently BLM managers may approve conservation use (nonuse for protection of the federal range) only on an annual basis. Under the Proposed Action, conservation use could be authorized for extended periods when needed to meet resource management objectives and comply with standards and guidelines. Long-term conservation use could be included in the conditions of grazing permits for up to the full 10 year term of the permit. Forage set aside for conservation purposes could not be used by other livestock operators. Nonuse requested solely for the personal convenience or economic benefit of a permittee could be approved for up to 3 years.

The Forest Service's current practice would not change. The proposed changes for BLM would make the two agencies consistent in their administration of nonuse.

### ***Suspended Nonuse***

Under the Proposed Action, both agencies would continue to deal with suspended nonuse as they do under Current Management. BLM grazing permits could contain both active and suspended nonuse animal unit months, and the Forest Service would not include suspended nonuse on its grazing permits.

### ***Water Rights***

The Proposed Action provides consistent direction for the BLM regarding water rights on public lands for livestock grazing purposes. It is intended to generally make BLM's policy consistent with Forest Service practice, and with BLM policy prior to being changed in the early 1980s.

Under the Proposed Action, any new rights to water on public land for livestock watering on such land would be acquired, perfected, maintained and administered under state law.

In all cases involving the development and registration, pursuant to state law, of new rights to water on public land for livestock watering, cooperative agreements would be used to provide that such livestock water rights are to be

used and maintained in conjunction with the grazing permit or leases and do not give rise to a claim for compensation in the event the permit or lease to which it is attached is canceled in whole or in part to devote the lands to another public purpose.

The proposal does not create any new federal reserved water rights, nor does it affect valid existing water rights. Any right or claim to water on public land for livestock watering on public land by or on behalf of the United States remains subject to the provisions of 43 U.S.C. 666 (the McCarran Amendment), and section 701 of Public Law 94-579 (the Federal Land Policy and Management Act disclaimer on water rights). Finally, it does not change existing BLM policy on water rights for uses other than public land livestock grazing, such as irrigation, municipal or industrial uses.

### ***Range Improvement Ownership***

The Proposed Action would require that title to all new grazing-related improvements constructed on public lands, or made to the vegetation resource of public lands, except temporary or removable improvements, would be in the United States. BLM would hold title to all permanent range improvements built in the future on public lands. The ownership of existing range improvements would not be affected. Permittees would hold a financial interest in proportion to their contribution for range improvements built under cooperative agreement. Permittees would continue to own temporary structures such as a dip tanks, loading chutes, or portable water troughs placed on public lands under permit. These proposed changes would make BLM policy consistent with current Forest Service policy.

### ***Range Betterment Fund Distribution***

The Proposed Action would change the way Range Betterment Funds are distributed. Under the Proposed Action, 25 percent of grazing receipts would be returned to the district of origin, and the remaining 25 percent would be returned to BLM state offices, which would then direct such funding on a priority basis for rangeland ecosystem rehabilitation and protection.

This change would make BLM's procedures equivalent to Forest Service policy, which allows the regional forester to distribute half of the



Forest Service's portion of the Range Betterment Funds within the Forest Service region wherever needed to meet priority rangeland improvement objectives.

### ***Range Betterment Fund Use***

The Proposed Action would revise BLM and Forest Service regulations and policies to expand and clarify the use of Range Betterment Funds. The proposed changes would allow such funds to be used for a wider range of activities needed to maintain and improve rangeland ecosystem health. Under the Proposed Action, these funds could be spent for planning projects, conducting environmental analyses and compliance inspections, building range improvements, and monitoring the effectiveness of range improvements in achieving rangeland ecosystem management objectives.

### ***Appeals***

The Proposed Action would expedite the review of requests to stay rangeland management decisions and would make grazing regulations consistent with the appeals provisions in 43 CFR 4.21, which govern other BLM actions.

Under the Proposed Action, persons choosing to appeal a decision of the authorized officer would be provided a 30-day period in which to file an appeal. Appellants requesting a stay of the decision would be required to file a petition for stay with their appeal. In the instance where a petition for stay has been filed with an appeal, the Department of the Interior's Office of Hearings and Appeals would have 45 days from the expiration of the 30-day appeal period either to grant or deny the petition for stay, in whole or in part. Thus, where a person has filed a petition for stay of the decision of the authorized officer along with an appeal, and where the request for stay is denied, implementation of the decision could be delayed up to 75 days. In the event a stay of the decision is granted, the decision would be stayed until such time as a determination on the appeal is made. This change is more consistent with Forest Service provisions.

As under Current Management, the Proposed Action would continue to give BLM managers the authority to make a decision effective on the date specified for emergency protection of rangeland resources.

Forest Service appeal provisions would not change. Use and occupancy decisions of authorized Forest Service officers would continue to be implemented automatically unless a stay of the decision is requested and granted. Procedures to obtain a stay of Forest Service decisions would follow appeal regulations in 36 CFR 251.91. Decisions made under NEPA would have an automatic 45-day stay if appealed (36 CFR 215). But the appeal must be resolved within the 45-day period.

### ***Grazing Advisory Boards***

The Proposed Action would establish multiple resource advisory councils. These councils would be subject to the Federal Advisory Committee Act (5 U.S.C. Appendix; FACA). The multiple resource advisory councils would focus on the full array of ecosystem and multiple use issues associated with BLM-administered public lands. However, the multiple resource advisory councils would not provide advice on internal BLM management concerns such as personnel or budget expenditures.

A multiple resource advisory council would typically be established for each BLM administrative district but under this proposed rule the area of jurisdiction could be modified to permit ecosystem-based management and planning. The Department intends that BLM state directors would be encouraged to consider whether the formation of multiple resource advisory councils along ecoregion boundaries would be a more effective organization for obtaining advice on the management of public lands within their areas of responsibility. A governor or multiple resource advisory council could petition the Secretary to authorize these councils at a BLM resource area level.

The multiple resource advisory councils would advise the Secretary of the Interior and BLM on matters relating to ecosystem and multiple use issues associated with public lands and resources under the administrative jurisdiction of the BLM. Multiple resource advisory councils would provide advice on preparation, amendment, and implementation of land use management plans, and would be consulted in the planning for range development and improvement programs and the preparation of standards and guidelines for grazing administration. The multiple resource advisory councils would not be involved in matters such as



personnel decisions, or the allocation of budget except to the extent of providing advice on the establishment of long-term plans and resource management priorities.

Membership of the multiple resource advisory council would reflect a balance of views to ensure that the council represents the full array of issues and interests associated with public land use, management, protection and an understanding of the federal laws and regulations governing public lands. Individuals would qualify to serve on a multiple resource advisory council because they have a commitment to collaborative effort, possess relevant experience or expertise, and they have a commitment to successful resolution of resource management issues and to applying the relevant law. An individual may serve on only one multiple resource advisory council.

Where a multiple resource advisory council has concerns that its advice is being arbitrarily disregarded, the council, upon agreement of all members, could request that the Secretary respond to such concerns within 60 days. This opportunity for direct communication with the Secretary is separate and distinct from the administrative appeals process and the Secretary's response would not constitute a decision on the merits of any issue that is or might become the subject of an administrative appeal.

Under the Proposed Action the multiple resource advisory councils could establish rangeland resource teams to enhance public and community-based involvement in public lands decision-making. Rangeland resource teams would provide local level input to the multiple resource advisory councils and would serve as fact-finding teams. The rangeland resource teams may, among other functions, provide input to the multiple resource advisory councils for grazing-related portions of land use plans and the planned expenditure of range improvement moneys. At the direction of the multiple resource advisory councils, rangeland resource teams may provide input and recommendations to the multiple resource advisory council for an area ranging from a single grazing allotment to the entire area under the jurisdiction of the multiple resource advisory council.

Local citizens could petition the multiple resource advisory council to establish a rangeland resource team, or a rangeland resource team could be established by the multiple resource advisory council on its own initiative. Techni-

cal review teams could also be established by the multiple resource advisory council.

The Forest Service currently does not use grazing advisory boards. Although these boards are authorized by regulations, the law authorizing them expired in 1985. Under the Proposed Action, the reference to grazing advisory boards would be removed from Forest Service regulations.

The Forest Service, however, does have authority to set up advisory boards consisting of a variety of resource interests and viewpoints. The Forest Service may use resource advisory boards to gain input to forest planning. All interested people and state, county, and federal agencies are given the opportunity to participate in forest planning and project decisions in accordance with NFMA and NEPA.

### *Service Charge/Transaction Fee*

Under the Proposed Action, the Forest Service would assess service charges or transaction fees for permittee-requested actions that require permit processing and supplemental billings. BLM would add service charges for applications made solely for temporary nonuse or conservation use. Forest Service and BLM fee practices would then be consistent. A service charge would be assessed for each crossing permit, transfer of grazing preference, application solely for nonuse, and each replacement or supplemental billing notice except for actions initiated by the authorized officer. The service fee would offset the costs of processing such applications.

### *Rangeland Ecosystems*

The Proposed Action would improve the current methods of making rangeland decisions to better integrate all of the biologic, cultural, social, and economic factors needed to maintain or restore ecosystems. Both agencies would implement policies to manage rangeland resources using an ecosystem approach.

Management attention would shift from narrow, short-term resource-specific issues toward broader objectives aimed at restoring or maintaining desired landscape conditions, environmental health, social amenities, and sustained economic well-being, all products of properly functioning ecosystems.

BLM would implement this approach in two ways: (1) through national requirements and



state or regional standards and guidelines that would ensure that livestock would graze in a manner compatible with properly functioning ecosystems and (2) through regulation changes that would reform the administration of the rangeland program to implement livestock management to speed up the restoring and improving of western rangelands.

The Forest Service would implement the ecosystem approach by changing its regulations to establish the authority and direction for managing rangeland resources and making site-specific rangeland project decisions on the basis of a landscape analysis of rangeland ecosystems subject to NEPA compliance. These decisions would be designed to accomplish specific, on-the-ground purposes or results that implement the programmatic management direction in the forest plan. Rangeland project decisions may include maintaining or modifying plant communities or other resource conditions, rangeland improvements, and authorizing livestock grazing.

Implementing ecosystem management may require permittee participation in resource monitoring and inventory. This approach would give the Forest Service and permittee greater flexibility to adjust annual operations to meet ecosystem objectives established in the landscape analysis.

### *Special Status Species*

Requirements of the Endangered Species Act and agency policy as discussed in the Current Management section of this chapter will continue to be implemented under this alternative.

### *Fee Incentives*

New provisions have been added to the proposed rule that would provide for a 30 percent incentive fee. The proposal would also restrict implementation of the \$3.96 base value in the event a separate regulation setting forth eligibility criteria for the incentive fee is not issued by 1997. In recent years the Department of the Interior has considered several proposals for incentive-based grazing fees targeted at encouraging good stewardship of the public lands. The Department intends to move forward in the preparation of a separate rule addressing incentive-based grazing fees in the near future.

That rule will set forth the eligibility criteria for the incentive fee.

To ensure timely development of that rule, this proposed action provides that an alternative base value of \$3.50 would be implemented in 1997 if the Departments have not completed the eligibility criteria. Such a discount would result in a grazing fee of \$2.77 per AUM in 1997 for qualifying permittees and lessees. The Department intends to use its best efforts to issue a final rule establishing incentive criteria in time to provide an opportunity for the reduced fee in grazing year 1996. Such a discount would result in a grazing fee of \$2.77 per AUM in 1996 and 1997 for qualifying permittees and lessees.

The criteria would focus primarily upon those permittees and lessees who agree to participate in special rangeland improvement programs characterized by best management practices, the furtherance of resource condition objectives, and comprehensive monitoring. The Department anticipates that eligibility criteria would require the permittee or lessee to undertake management practices beyond those otherwise required by law and regulation to benefit the ecological health of the public rangelands.

## **Management Alternative 3: Livestock Production**

The Livestock Production alternative would place more control of rangeland management in local communities. (Table 2-3 summarizes key elements of this alternative.) BLM and Forest Service would continue to fulfill their responsibilities under laws and regulations. A goal of this alternative is to meet interdisciplinary resource objectives through increased cooperation and shared responsibility for good stewardship among BLM, the Forest Service, and the livestock industry. Local community involvement in grazing advisory boards would play a lead role in making decisions about public rangelands management planning, implementation, and evaluation.

The Livestock Production alternative would reward ranchers who are good stewards of the federal lands. As under other alternatives, regulation changes (described in detail later in this section) would make BLM and Forest Service program administration more efficient and consistent. These changes in regulations or poli-





**Table 2-3: Key Elements of the Livestock Production Alternative**

<b>Standards and Guidelines</b>	<b>Leasing</b>	<b>Foreign Corporations</b>	<b>Disqualification</b>	<b>Prohibited Acts</b>	<b>Grant Policy</b>
<b>BLM-Yes</b> <b>FS-Yes</b>	<b>BLM-Own or control</b> <b>FS-Own or control</b>	<b>BLM-U.S. citizenship required</b> <b>FS-U.S. citizenship required</b>	<b>BLM-Grazing advisory board determines</b> <b>FS-Grazing advisory board determines</b>	<b>BLM-Bald Eagle Protection Act and ESA violations</b> <b>FS-Broad range of conditions</b>	<b>BLM-Performance criteria first priority</b> <b>FS-Performance criteria first priority</b>
<b>Permit Tenure</b>	<b>Unauthorized Use</b>	<b>Nonuse</b>	<b>Suspended Nonuse</b>	<b>Water Rights</b>	<b>Range Improvement Ownership</b>
<b>BLM-10 yrs. min.; up to 20 yrs. good stewardship</b> <b>FS-10 yrs. min.; up to 20 yrs. good stewardship</b>	<b>BLM-One fee; nonmonetary settlement</b> <b>FS-One fee; nonmonetary settlement</b>	<b>BLM-Up to 5 yrs. personal; yr. to yr. resource protection</b> <b>FS-Up to 5 yrs. personal; yr. to yr. resource protection</b>	<b>BLM-Carry on permit</b> <b>FS-None</b>	<b>BLM-Mixed ownership</b> <b>FS-Mixed ownership</b>	<b>BLM-Mixed</b> <b>FS-Mixed</b>
<b>Range Betterment Fund Distribution</b>	<b>Range Betterment Fund Use</b>	<b>Appeals</b>	<b>Grazing Advisory Boards</b>	<b>Service Charge/ Transaction Fee</b>	<b>Rangeland Ecosystems</b>
<b>BLM &amp; FS-All to district of origin</b>	<b>BLM-Engineer &amp; build</b> <b>FS-Plan &amp; build</b>	<b>BLM-Automatic stay upon appeal; full force &amp; effect for resource protection</b> <b>FS-No automatic stay upon appeal for permit administration decisions</b>	<b>BLM-Yes (allow for grazing associations)</b> <b>FS-Yes (allow for grazing associations)</b>	<b>BLM-None</b> <b>FS-None</b>	<b>BLM-Consult with grazing advisory boards</b> <b>FS-Consult with grazing advisory boards</b>

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cies would improve the agencies' abilities to manage federal land.

### National Requirements and Standards and Guidelines

Under the Livestock Production alternative, BLM would develop standards and guidelines at the regional level with strong permittee and grazing advisory board involvement. Regional standards and guidelines would be incorporated into BLM's land use plans. As under Current Management, the Forest Service would maintain national policy and objectives and would estab-

lish local standards and guidelines within forest plans.

### Rangeland Program Administration

#### Leasing

Under the Livestock Production alternative, the Forest Service would allow base property leases and management leases (pasture agreements), and Forest Service regulations would then conform to BLM current regulations. All leases would be issued for at least 1 year. Permittees would be allowed to graze another



person's livestock if they can prove that they control the livestock. Local grazing advisory boards would determine the validity of the leases.

### ***Foreign Corporations***

BLM and the Forest Service would prohibit foreign corporations from holding federal grazing permits under the Livestock Production alternative.

### ***Disqualification***

To acquire a federal grazing permit under the Livestock Production alternative, applicants would need a satisfactory record of performance as determined by local grazing advisory boards. In addition, both agencies would disqualify permittees from holding federal grazing permits if they have had permits canceled for violating agency regulations.

### ***Prohibited Acts***

Under the Livestock Production alternative, both agencies would enforce prohibited acts as they do under Current Management. BLM grazing regulations would allow imposing penalties for violating the Bald Eagle Protection Act and the Endangered Species Act, and the Forest Service would control prohibited acts through existing law enforcement regulations and grazing permit conditions.

### ***Grant Policy***

The Livestock Production alternative would add another criterion in issuing permits to operators who have shown that they can improve the condition of rangeland ecosystems.

### ***Permit Tenure***

Under the Livestock Production alternative, the length of permits would be determined by permittee performance as follows:

- 20 years for a documented record of substantial compliance with terms of permits and management of operations to achieve or maintain interdisciplinary resource objectives. (This change would

require a change in the Federal Land Policy and Management Act.)

- 10 years for the lack of a documented record of substantial compliance with terms of permits.

### ***Unauthorized Use***

Under the Livestock Production alternative both agencies would allow nonmonetary settlements where unauthorized use is clearly unintentional, incidental, and nondamaging to the land, and where no substantial forage is consumed. In addition, the unauthorized use animal unit month (AUM) fee would be the same as the nonwillful fee that would be assessed under both the Proposed Action and Current Management. But fees would not be increased for willful or repeated willful unauthorized use.

### ***Nonuse***

BLM and the Forest Service under the Livestock Production alternative could authorize up to a 5-year block of nonuse for permittee personal convenience and year-to-year nonuse for resource protection.

### ***Suspended Nonuse***

Under the Livestock Production alternative, both agencies would continue to deal with suspended nonuse as they do under Current Management. BLM grazing permits could contain both active and suspended nonuse animal unit months, and the Forest Service would not include suspended nonuse on its grazing permits.

### ***Water Rights***

Under the Livestock Production alternative, neither agency would protest water right filings by federal permittees on public lands. This change would apply only to future filings. Additionally, under this alternative, neither agency would file for water rights.

### ***Range Improvement Ownership***

Under the Livestock Production alternative, both BLM and the Forest Service would hold title to future range improvements, and permittees



would hold financial interest to improvements in proportion to their contributions.

### ***Range Betterment Fund Distribution***

Under Livestock Production, 50 percent of all grazing fees collected would be returned to the forest or BLM district of origin. Payments to counties and the U.S. Treasury would not change.

### ***Range Betterment Fund Use***

Range Betterment Funds under Livestock Production would be used just as they are under Current Management except that grazing advisory boards would determine spending priorities, which would mainly focus on range improvement projects benefitting livestock.

### ***Appeals***

Under the Livestock Production alternative, both agencies would deal with full force and effect as they do under Current Management. Forest Service regulations would not allow a decision under appeal to be automatically deferred (36 CFR 251). Decisions made under National Environmental Policy Act would have an automatic 45-day stay if appealed (36 CFR 215), the appeal would have to be resolved within the 45-day period. Unless placed in full force and effect in an emergency to stop resource deterioration, a BLM manager's appealed final grazing decisions would not be implemented until any appeal is resolved.

### ***Grazing Advisory Boards***

Both agencies under Livestock Production would have grazing advisory boards or, where suitable, combined grazing advisory boards for Forest Service- and BLM-administered lands in the same areas. With expanded roles in public involvement, planning, decisionmaking, monitoring, and setting resource management objectives, grazing advisory boards would recommend policies more suitable to local areas through review of the following:

- Qualifications for holding permits and licenses
- Livestock ownership requirements

- Base property requirements
- Upper and lower limits on number of livestock permitted
- Priorities for spending Range Betterment Funds
- Criteria for evaluating the validity of leases
- Local standards and guidelines for livestock management
- The need for and definition of suitability thresholds
- Rangeland ecosystem goals and objectives

Grazing advisory boards would cooperate with the agencies to promote the forming of livestock grazing associations and developing grazing agreements patterned after those used on national grasslands. A grazing agreement would be issued to the association as a single permit in place of issuing a permit to each operator. The grazing agreement would authorize the association to graze rangelands administered by the agencies and administer grazing permits subject to the agencies' rules, policies, and procedures. The associations would do the following:

- Control membership qualifications.
- Apportion permitted use to members.
- Enforce permit compliance using methods including suspension and cancellation of membership and grazing privileges.
- Resolve and manage unauthorized use.
- Collect grazing fees from members.
- Build and maintain rangeland improvements authorized by the agencies.
- Provide other permit and rangeland management services as negotiated with the agencies.



The costs of administering the grazing program and building agency-authorized improvements—normally the responsibility of the agencies—would be credited against the fees collected by the grazing association up to 50 percent of the average total fee collected. Range Betterment Funds would not be returned to BLM from grazing fees collected under grazing agreements. This funding process would be patterned after the use of Conservation Practice Funds on national grasslands.

### *Service Charge/Transaction Fee*

Under the Livestock Production alternative, BLM and Forest Service would eliminate all service charges and transaction fees.

### *Rangeland Ecosystems*

Under the Livestock Production alternative, goals and objectives for rangeland ecosystems would be set at the local level through consultation with grazing advisory boards. Decisions would emphasize the human component of rangeland ecosystems.

### *Special Status Species*

Requirements of the Endangered Species Act and agency policy as discussed in the Current Management section of this chapter will continue to be implemented under the Livestock Production alternative.

## **Management Alternative 4: Environmental Enhancement**

The Environmental Enhancement alternative would shift the philosophical basis for livestock grazing from “livestock grazing will continue unless problems are documented through monitoring” to “livestock grazing will be authorized only where enough data shows resource condition standards and goals are being met.” This alternative would focus on authorizing grazing where it is most acceptable in light of other resources and uses (Table 2-4 summarizes key elements of this alternative.)

Some areas would be closed to grazing: wilderness, critical habitat for threatened and endangered (T&E) species, developed recreation

sites, and areas of unacceptable rangeland health. Grazing might, however, be allowed on areas with formerly unacceptable rangeland health when conditions improve and the intensity of proposed management would ensure that grazing would not degrade conditions.

This alternative may require amending existing legislation, such as the Wilderness Act of 1964, which allows livestock grazing. Following improvement in resource conditions, livestock grazing might be allowed to resume in some areas.

## **National Requirements and Standards and Guidelines**

The Environmental Enhancement alternative would have no national-level requirements but would have national-level standards and guidelines for both agencies. Regional minimum standards and guidelines, including desired plant community descriptions, would be established for BLM lands. For Forest Service-administered lands, additional detailed policy would be formulated to define ecological goals and acceptable limits of change for resource conditions. This new policy would complement the standards and guidelines now included in Forest Service land and resource management plans.

Under this alternative, BLM and the Forest Service would adopt and implement national standards and guidelines to assure that livestock grazing is conducted consistently and in accordance with proven principles already being successfully applied in rangeland ecosystems. Standards and guidelines would be aimed at maintaining and restoring ecosystem health. Management practices that diminish ecosystem health would be modified or eliminated. Activities promoting ecosystem health would be implemented.

BLM would implement standards and guidelines in a variety of ways. For example, some standards and guidelines would be implemented through design and contract specifications for range improvements. Others would be implemented through terms attached to grazing permits and related authorizations. Failure to comply with such terms could result in a permit being canceled; grazing systems, stocking levels, or seasons of use being modified; or other changes being made.





**Table 2-4: Key Elements of the Environmental Enhancement Alternative**

<b>Standards and Guidelines</b>	<b>Leasing</b>	<b>Foreign Corporations</b>	<b>Disqualification</b>	<b>Prohibited Acts</b>	<b>Grant Policy</b>
<b>BLM-Yes</b> <b>FS-Yes</b>	<b>BLM-Requires</b> ownership <b>FS-Requires</b> ownership	<b>BLM-U.S. citizen</b> or licensed to conduct business in U.S. <b>FS-U.S. citizen</b> or licensed to conduct business in U.S.	<b>BLM-In addition</b> to Proposed Action, all permits canceled <b>FS-In addition</b> to Proposed Action, all permits canceled	<b>BLM-Broad</b> range of conditions <b>FS-Broad range</b> of conditions	<b>BLM-No</b> allocations of more forage <b>FS-No alloca-</b> tions of more forage
<b>Permit Tenure</b>	<b>Unauthorized Use</b>	<b>Nonuse</b>	<b>Suspended Nonuse</b>	<b>Water Rights</b>	<b>Range Improvement Ownership</b>
<b>BLM-10 yrs.</b> <b>FS-10 yrs.</b>	<b>BLM-Three-tiered</b> fee formula; nonmonetary settlement <b>FS-Three-tiered</b> fee formula; nonmonetary settlement	<b>BLM-Automatic,</b> up to 10 yrs. nonuse <b>FS-Automatic,</b> up to 10 yrs. nonuse	<b>BLM-Eliminate</b> <b>FS-None</b>	<b>BLM-Federal</b> ownership of new water rights, subject to state law <b>FS-Same as</b> BLM	<b>BLM-Federal</b> <b>FS-Federal</b>
<b>Range Betterment Fund Distribution</b>	<b>Range Betterment Fund Use</b>	<b>Appeals</b>	<b>Grazing Advisory Boards</b>	<b>Suitability</b>	<b>Service Charge/ Transaction Fee</b>
<b>BLM-1/2 district</b> of origin, 1/2 state director discretion <b>FS-1/2 forest of</b> origin, 1/2 regional forester discretion	<b>BLM-Plan,</b> engineer, build, & environmental assessment <b>FS-Plan,</b> engineer, build, & environmental assessment	<b>BLM-No</b> automatic stay upon appeal <b>FS-No automatic</b> stay upon appeal for permit administration decisions	<b>BLM-Replace w/</b> resource advisory councils <b>FS-Replace w/</b> resource advisory councils	<b>BLM-Sensitive</b> areas nonsuitable <b>FS-Sensitive</b> areas nonsuitable	<b>BLM-Charges to</b> cover processing <b>FS-Charges to</b> cover processing
<b>Rangeland Ecosystems</b>					
<b>BLM-All uses</b> managed to sustain ecosystems <b>FS-All uses</b> managed to sustain ecosystems					



Some areas may require total rest from livestock grazing until desired resource conditions are reached. Where an area is not progressing toward meeting desired conditions, BLM would immediately act to correct the situation.

The Forest Service would continue to formulate standards and guidelines for rangeland management, including livestock grazing, while it prepares national forest land and resource management plans (forest plans) for each national forest and grassland. This alternative would require that these forest plan standards and guidelines be made part of the conditions of term grazing permits and that annual grazing use and permit renewal depend on the permittee's following them. Failure to comply with forest plan standards and guidelines would violate the conditions of the grazing permit and could result in livestock numbers being reduced or grazing permits being canceled.

### *Definitions*

**Properly functioning uplands:** Uplands function properly when vegetation and ground cover maintain soil conditions that can sustain natural biotic communities. The functioning condition of uplands results from the interaction of geology, soil, climate, water, biological activity, and landform.

**Nonfunctioning uplands:** Uplands are functioning improperly when vegetation and ground cover are not maintaining soil conditions that can sustain natural biotic communities.

**Uplands that are functioning but susceptible to degradation:** These areas function properly, but because of livestock grazing or related management practices, the capability of vegetation or soil conditions to sustain natural biotic communities is threatened.

**Properly functioning riparian-wetland areas:** Riparian-wetland areas are functioning properly when adequate vegetation, landform, or large woody debris is present to dissipate the stream energy of high waterflows, thereby reducing erosion and water quality; filter sediment, capture bedload, and aid floodplain development; improve flood-water retention and ground-water recharge, develop root masses that

stabilize streambanks against cutting action; develop diverse ponding and channel characteristics to provide the habitat and water depth, duration, and temperature needed for fish production, waterfowl breeding, and other uses; and support greater biodiversity. The functioning condition of riparian-wetland areas is a result of interaction among geology, soil, water, and vegetation.

**Nonfunctioning riparian-wetland areas:** Riparian-wetland areas that clearly are not providing adequate vegetation, landform, or large woody debris to dissipate stream energy associated with high flows and thus are not reducing erosion, improving water quality, etc., as listed above. The absence of physical attributes such as a floodplain where one should be are indicators of nonfunctioning condition.

**Wetland-riparian areas that are functioning but susceptible to degradation:** Riparian-wetland areas that are in functioning condition but an existing soil, water, or vegetation attribute makes them susceptible to degradation.

### *National Standards and Guidelines*

- (1) Grazing management practices will be implemented to assist the recovery of threatened and endangered species and to prevent species listed as Category 1 or 2 from becoming threatened or endangered. Emphasis will be placed on maintaining or improving plant and animal habitat to avoid future listing.
- (2) Grazing practices (such as best management practices) that protect public health and welfare; maintain, restore, or improve water quality; and result in water quality that meets or exceeds state water quality standards will be implemented through conditions of permits and leases.
- (3) Grazing schedules will include rest periods during times of critical plant growth or regrowth. The timing and duration of rest periods will be determined by the local authorized officer administering the grazing authorization.



- (4) Where assessments or other data reveal that key resources or watershed functioning requirements are not being met because of livestock overuse, the authorized officer will adjust grazing use before the next grazing season and may require total rest.
- (5) Continuous season-long grazing will be authorized only when it has been shown to be consistent with achieving properly functioning condition and meeting resource objectives.
- (6) Pesticides will be used only on rangelands where target species are well defined, where there is a minimal risk to nontarget species and surface and ground water, and research or experience shows that other alternatives will not be effective.
- (7) Terms of each permit or lease will include numbers, kind, and class of livestock; seasons of use; period of deferment or rest; and other strategies needed to achieve resource objectives.
- (8) Springs, seeps, and other projects affecting water and related resources will be designed to maintain or improve the ecological and hydrological values of those sites.
- (9) Grazing will be authorized on designated ephemeral (annual and perennial) rangeland only if production has been reliably estimated, a level of annual growth or residue has been established to remain onsite at the end of the grazing season, and harmful effects on perennial species will be avoided.
- (10) Riparian-wetland objectives will be met by locating livestock management facilities (corrals or holding facilities, well, pipelines, fences) or livestock management practices (salting and supplemental feeding) outside riparian-wetland areas wherever possible. Where existing livestock management facilities or practices do not meet management ob-

jectives, BLM will take actions, which may include relocating or removing facilities or practices.

- (11) Utilization or residual vegetation targets will be established to do the following:
  - (a) Maintain, improve, or restore both herbaceous and woody species (where present or potential exists) to healthy and vigorous condition and facilitate reproduction and maintenance of different age classes in the desired riparian-wetland and aquatic plant communities.
  - (b) Leave enough vegetation biomass and plant residue (including woody debris) to allow adequate sediment filtering and dissipation of stream energy for bank protection.

### ***Regional Standards and Guidelines***

Standards and guidelines for BLM's rangeland management program may be further developed and refined through a series of tiered analyses and decisions. The preceding national standards and guidelines would be mandatory and represent the minimum requirements that would apply to BLM and grazing permittees. These national standards and guidelines would serve as an umbrella for regional standards and guidelines, which typically would be developed for large areas or ecoregions in the West.

Regional standards and guidelines would be prepared when needed to ensure that management of livestock grazing is sensitive to the resources of specific ecoregions. These regional standards and guidelines would be incorporated into BLM resource management plans following completion of needed NEPA analyses and documentation. Regional standards and guidelines would be implemented in the same manner as national standards and guidelines.

More detailed, site-specific standards and guidelines might also be developed if needed. Consistent with national and regional standards and guidelines, they would represent the best science for managing the ecosystems involved.



## Rangeland Program Administration

### *Leasing*

Under the Environmental Enhancement alternative, BLM would require ranchers to own base property and livestock to be granted permits. Leasing base property and water-base leases would not be authorized, and permittees could not pasture someone else's livestock. These changes would make BLM regulations consistent with current Forest Service practices, which would not change.

Both agencies, however, would continue to allow permittees with allotments containing intermingled private land to graze livestock they do not own under existing permitting provisions—exchange of use permits for BLM and private land permits for the Forest Service.

### *Foreign Corporations*

As under the Proposed Action, the Environmental Enhancement alternative would require Forest Service regulations to conform with BLM regulations and eliminate the requirement that corporations holding grazing permits be owned by U.S. citizens. The requirements to hold either a BLM or Forest Service permit would be either U.S. citizenship or a business licensed to operate in the state.

### *Disqualification*

Under the Environmental Enhancement alternative, both the Forest Service and BLM would prohibit permittees from holding grazing permits for up to 3 years if they have had any federal grazing permits canceled for violating laws or federal grazing regulations. In addition, if one permit is canceled for violations of grazing regulations, all the permittee's federal grazing permits would be canceled. Permits could also be canceled for violations before the effective date of the new regulations.

### *Prohibited Acts*

Under the Environmental Enhancement alternative, as under the Proposed Action, a prohibited act would consist of the violation of any federal or state law or regulation conserving or protecting natural or cultural resources or en-

vironmental quality. Penalties for committing a prohibited act could include canceling or suspending of permits. This provision would apply to Forest Service and BLM permittees.

### *Grant Policy*

The Environmental Enhancement alternative would remove BLM and Forest Service provisions and criteria for allocating more forage to grazing operations. Forage could not be allocated above current preference or permitted numbers, even after desired ecological conditions are reached. Environmental Enhancement is the only alternative that would not allow for allocating more forage should it become available.

### *Permit Tenure*

The Environmental Enhancement alternative would retain current provisions on permit tenure. Ten-year term grazing permits would be issued to permittees who have records of substantial compliance with the terms of permits, including standards and guidelines, and who have helped maintain or achieve desired resource conditions on their allotments.

### *Unauthorized Use*

The Environmental Enhancement alternative would address unauthorized use in the same way as the Proposed Action. Nonmonetary settlements would be allowed where unauthorized use is clearly unintentional, incidental, and causes no resource damage, and where no substantial forage is consumed. This change would be consistent with Government Accounting Office findings and recommendations (GAO 1990): The three existing categories of fines described for Current Management would be retained.

The Forest Service would replace its term "excess use" with BLM's term "unauthorized use" and adopt BLM's three levels of financial penalties for unauthorized use—nonwillful, willful, and repeated willful. Both agencies would define unauthorized use and apply financial penalties consistently.

### *Nonuse*

The Forest Service and BLM, under the Environmental Enhancement alternative, would



allow nonuse for up to the length of the term grazing permit or at most 10 years. Under the revised regulations, the authorized officer would place forage in nonuse status for the time specified by a permittee wanting to withdraw forage from livestock grazing for personal convenience; for improving wildlife habitat, riparian areas, or recreation; or for promoting general resource conservation. The other management alternatives would require authorized officer approval of nonuse, whereas under Environmental Enhancement, the agencies would automatically approve nonuse.

### ***Suspended Nonuse***

The Environmental Enhancement alternative would eliminate suspended nonuse from BLM grazing permits, making BLM consistent with the Forest Service. BLM would no longer need to keep a record of AUMs that were once but are no longer allowed for livestock grazing. Animal unit months (AUMs) of suspended nonuse attached to permits would be eliminated as permits are renewed or transferred.

### ***Water Rights***

The Environmental Enhancement alternative is the same as the Proposed Action.

### ***Range Improvement Ownership***

The Environmental Enhancement alternative is the same as the Proposed Action.

### ***Range Betterment Fund Distribution***

Under the Environmental Enhancement alternative, as under the Proposed Action, BLM regulations and policy would be changed to provide greater flexibility in distributing Range Betterment Funds. BLM state directors could distribute half of the Range Betterment Funds allocated to their states, and regional foresters would continue to have discretion to distribute half of Forest Service Range Betterment Funds. In both cases, the remaining half would be returned to the BLM district or Forest Service forest of origin. Funds could then be moved from where they were earned to where they might be needed for special programs. This change would not affect payments to counties or the U.S. Treasury.

### ***Range Betterment Fund Use***

Like the Proposed Action, the Environmental Enhancement alternative would expand authorized uses for Range Betterment Funds for both Forest Service and BLM. Range Betterment Funds could then be used for project planning, layout and design, contract preparation, installation, easement acquisition, inspection, maintenance, modification, and monitoring effectiveness in meeting resource condition objectives. Range improvement projects include all projects designed to improve rangeland conditions, mitigate the impacts of livestock grazing on other resources, or meet resource objectives on public rangelands.

### ***Appeals***

Under the Environmental Enhancement alternative as under the Proposed Action, BLM managers would have broader authority to implement decisions in full force and effect and exempt certain administrative actions from the appeals process. Grazing decisions under appeal would not be automatically stayed. This change would be consistent with current Forest Service occupancy and use regulations and BLM regulations for nonlivestock-related decisions.

### ***Grazing Advisory Boards***

The Environmental Enhancement alternative would amend Forest Service and BLM regulations to eliminate provisions for grazing advisory boards. Joint BLM-Forest Service resource advisory councils would be set up on an ecoregion basis. These councils would consist of representatives of all interests and levels of government within the ecoregion. Environmental Enhancement is the only alternative that requires an advisory council on an ecosystem basis.

### ***Suitability***

Under the Environmental Enhancement alternative, BLM and the Forest Service would consider certain sensitive areas unsuitable for livestock grazing, including all areas not in proper functioning condition, all areas functioning but susceptible to degradation (until they



are brought into proper functioning condition), and all areas whose functioning condition is unknown (until they are evaluated and determined to be in proper functioning condition). Also considered unsuitable for grazing would be Forest Service-administered lands that are not meeting forest plan objectives due to livestock grazing or whose condition is unknown.

Other areas that would be closed to livestock grazing would be developed recreation sites, areas of national historic significance, designated wilderness areas, BLM wilderness study areas recommended as suitable for wilderness, Forest Service-recommended wilderness areas, and areas where livestock grazing conflicts with designated critical habitat for federally listed threatened or endangered species (for example, desert tortoise, or Pacific salmon). In addition, domestic sheep would not be allowed to graze in bighorn sheep range.

Under the Environmental Enhancement alternative, anyone with an interest in livestock grazing on Forest Service- or BLM-administered lands could petition the departmental secretary with jurisdiction to designate an area as unsuitable for livestock grazing or to terminate an unsuitability classification. The secretary would then have 8 months to conduct hearings and rule on the petition.

### ***Service Charge/Transaction Fee***

Under the Environmental Enhancement alternative, both BLM and the Forest Service would collect service charges and transaction fees to cover the cost of processing the paperwork. The agencies would require a service charge for each crossing permit, transfer of grazing preference, applications for temporary nonuse or conservation use, and replacement or supplemental billing notice, except for actions initiated by the authorizing officer.

### ***Rangeland Ecosystems***

The Environmental Enhancement alternative places greater emphasis on managing all uses, including livestock grazing, to sustain ecosystem biodiversity and ecological processes. This emphasis would be included in regulations and policy for the Forest Service and for BLM.

### ***Special Status Species***

Requirements of the Endangered Species Act and agency policy as discussed in the Current Management section of this chapter will continue to be implemented under Environmental Enhancement.

## **Management Alternative 5: No Grazing**

Under Alternative 5, No Grazing, all grazing privileges would be canceled, and all livestock would be removed from public lands over a 3-year phaseout period. (Table 2-5 summarizes key elements of this alternative.) Public lands would be managed for values other than livestock grazing. No new range improvement projects would be built to benefit livestock, and existing range improvements and land treatments would be maintained only if considered beneficial to other uses. Any structures considered harmful to other resource uses would be removed, and permittees with investments in cooperative range projects would be entitled to salvage rights. Owners of land adjoining federal lands would be responsible for preventing the unauthorized use of these federal lands. The agencies would not pay any costs for needed fencing. Range administration would concentrate on issuing crossing permits to or from nonfederal land inholdings and resolving unauthorized livestock use. None of the other livestock grazing management measures considered in the other four alternatives would be needed.

Under No Grazing, BLM and the Forest Service would reserve the right to use livestock to manage vegetation to achieve resource objectives. For example, sheep and goats might be used to control such noxious weeds as leafy spurge, or livestock might be used to stimulate the growth or sprouting of browse to improve forage for deer. Operations using such control methods would not gain grazing preferences or term permit status.

Livestock use would be permitted in a variety of ways, including the issuance of temporary permits or contracts that spell out the conditions of the permit. Fees might or might not be charged, depending on the objectives. In some cases the agencies would pay the livestock owner for the services received.





**Table 2-5: Key Elements of the No Grazing Alternative**

<b>Standards and Guidelines</b>	<b>Leasing</b>	<b>Foreign Corporations</b>	<b>Disqualification</b>	<b>Prohibited Acts</b>	<b>Grant Policy</b>
BLM-No FS-Yes	N.A.	N.A.	N.A.	N.A.	N.A.
<b>Permit Tenure</b>	<b>Unauthorized Use</b>	<b>Nonuse</b>	<b>Suspended Nonuse</b>	<b>Water Rights</b>	<b>Range Improvement Ownership</b>
BLM- Temporary: up to 1 yr. FS-Temporary: up to 1 yr.	BLM-Three-tiered fee formula; nonmonetary settlement FS-Three-tiered fee formula; nonmonetary settlement	N.A.	N.A.	N.A.	BLM-Federal FS-Federal
<b>Range Betterment Fund Distribution</b>	<b>Range Betterment Fund Use</b>	<b>Appeals</b>	<b>Grazing Advisory Boards</b>	<b>Service Charge/ Transaction Fee</b>	<b>Rangeland Ecosystems</b>
BLM-No range betterment fund FS-No range betterment fund	N.A.	N.A.	N.A.	BLM-Charges to cover trailing permits FS-Charges to cover trailing permits	N.A.

BLM and the Forest Service would both continue developing policies but not regulations on ecosystem management specifically for rangeland ecosystems. These policies could establish procedures for how and where livestock might be used as management tools to help achieve landscape or ecosystem objectives.

**National Requirements and Standards and Guidelines**

Standards and guidelines would not be needed under No Grazing since grazing would not be an ongoing activity on federal rangelands. Regional or local policies and direction could be developed to guide the use of livestock as a vegetation treatment tool. Existing direction on the issuance and use of crossing permits would be continued although future modification may be needed. Forest Plans would continue to have

standards and guidelines for using livestock to manage vegetation for achieving other resource objectives.

**Rangeland Program Administration**

*Leasing*

Leasing would not apply to the No Grazing alternative, since ownership of livestock used in vegetation treatment would not be an issue.

*Foreign Corporations*

Foreign interests would not apply to the No Grazing alternative. In vegetation treatment and with crossing permits, the ownership of the livestock would not be a question or factor of issuance.



### ***Disqualification***

Disqualification would not apply to the No Grazing alternative. Failure to comply with the conditions of crossing permits or vegetation treatment permits or contracts could disqualify a person or corporation from being issued future permits. Failure to comply with other environmental laws would be handled through the legal system.

### ***Prohibited Acts***

Prohibited acts would not apply to the No Grazing alternative. Since a person or corporation would not be issued a term permit, permits could not be canceled. Failure to comply with other environmental laws would be handled through the legal system.

### ***Grant Policy***

Grant Policy would not apply to the No Grazing alternative. The agencies would issue contracts for vegetation treatment under a competitive bid procedure.

### ***Permit Tenure***

All permits that would be issued for crossing or vegetation management would be temporary, usually for less than a year.

### ***Unauthorized Use***

Both agencies would enforce rules regarding unauthorized use of federal lands. Landowners grazing unfenced private or state lands adjoining federal lands would have to control their livestock to avoid unauthorized use. The agencies would not contribute to fencing or other costs associated with controlling livestock.

This alternative would address penalties for unauthorized use in the same way as the Proposed Action. Nonmonetary settlements would be allowed where unauthorized use is clearly unintentional, incidental, and causes no resource damage, and where no substantial forage is consumed. This change would be consistent with Government Accounting Office findings and recommendations (GAO 1990). The three existing categories of fines described for Current Management would be retained.

The Forest Service would replace its term "excess use" with BLM's term "unauthorized use" and adopt BLM's three levels of financial penalties for unauthorized use—nonwillful, willful, and repeated willful. Both agencies would define unauthorized use and apply financial penalties consistently.

### ***Nonuse***

Nonuse would not apply to the No Grazing alternative. Temporary permits for crossing or vegetation treatment would be issued for a given number of livestock, and nonuse would not become a factor of administration.

### ***Suspended Nonuse***

Suspended Nonuse would not apply to the No Grazing alternative since it applies only to term permits, which would not be issued under this alternative.

### ***Water Rights***

Water rights would not be an issue relating to grazing administration under the No Grazing alternative. There would be no permittees to file for water rights for livestock water developments on public lands.

### ***Range Improvement Ownership***

Under the No Grazing alternative, all range improvements would be owned by the Federal Government. Current permittees would have salvage rights for improvements they own on BLM-administered lands. On Forest Service-administered lands permittees would be reimbursed for their investment in certain improvements in accordance with their existing permits.

### ***Range Betterment Fund Distribution***

Under the No Grazing alternative, fees received for temporary crossing and vegetation treatment permits would be returned to the U.S. Treasury and counties according to existing policies. A Range Betterment Fund would not exist.



### Range Betterment Fund Use

A Range Betterment Fund to invest in range and other types of improvements would not exist under the No Grazing alternative. Removing unwanted improvements would be the responsibility of the benefitting program (wildlife, recreation). New improvements needed to manage vegetation treatment would also be the responsibility of benefitting programs. Most of these improvements, such as electric fences or water troughs, would likely be temporary.

### Appeals

As under the Proposed Action, grazing decisions under appeal would no longer be automatically stayed.

### Grazing Advisory Boards

Under No Grazing, without broad-scale grazing, grazing advisory boards would not be needed.

### Service Charge/Transaction Fee

Service charges and transaction fees would generally not be needed under the No Grazing

alternative. But a service charge would continue to be applied for trailing permits as specified in the current regulations.

### Rangeland Ecosystems

Under No Grazing, BLM and the Forest Service would continue to develop methods and procedures for promoting ecosystem management. These methods and procedures would not consider general livestock use. Where needed, livestock would be used to help reach or maintain vegetation objectives.

### Special Status Species

Requirements of the Endangered Species Act and agency policy as discussed in the Current Management section of this chapter will continue to be implemented under this alternative.

## Comparison of Management Alternatives

Table 2-6 provides a side-by-side comparison of the five management alternatives considered in detail, as well as a comparison of BLM and Forest Service rangeland management policies and regulations.

**Table 2-6:** Description of the Management Alternatives

Elements	Current Management	Proposed Action	Livestock Production	Environmental Enhancement	No Grazing
<b>Standards and Guidelines</b>	BLM-No FS-Yes	BLM-Yes FS-Yes	BLM-Yes FS-Yes	BLM-Yes FS-Yes	BLM-No FS-Yes
<b>Leasing</b>	BLM-Own or control FS-Requires ownership	BLM-Own or control; add surcharges (except for sons and daughters) FS-Requires ownership	BLM-Own or control FS-Own or control	BLM-Requires ownership FS-Requires ownership	N.A.
<b>Foreign Corporations</b>	BLM-U.S. citizen or licensed to conduct business in state FS-U.S. citizen or corp. 80% owned by U.S. citizens	BLM-U.S. citizen or licensed to conduct business in state FS-U.S. citizen or licensed to conduct business in U.S.	BLM-U.S. citizenship required FS-U.S. citizenship required	BLM-U.S. citizen or licensed to conduct business in U.S. FS-U.S. citizen or licensed to conduct business in U.S.	N.A.

*continued...*





**Table 2-6 (continued):** Description of the Management Alternatives

Elements	Current Management	Proposed Action	Livestock Production	Environmental Enhancement	No Grazing
<b>Disqualification</b>	<b>BLM</b> -None <b>FS</b> -None	<b>BLM</b> -Can't apply for permit if any are canceled within last 3 yrs. <b>FS</b> -Can't apply for permit if any are canceled within last 3 yrs.	<b>BLM</b> -Grazing advisory board determines <b>FS</b> -Grazing advisory board determines	<b>BLM</b> -In addition to Proposed Action, all permits canceled <b>FS</b> -In addition to Proposed Action, all permits canceled	N.A.
<b>Prohibited Acts</b>	<b>BLM</b> -Bald Eagle Protec. Act and ESA violations <b>FS</b> -Broad range of conditions	<b>BLM</b> -Broad range of conditions <b>FS</b> -Broad range of conditions	<b>BLM</b> -Bald Eagle Protec. Act and ESA violations <b>FS</b> -Broad range of conditions	<b>BLM</b> -Broad range of conditions <b>FS</b> -Broad range of conditions	N.A.
<b>Grant Policy</b>	<b>BLM</b> -Prioritized; no performance criteria <b>FS</b> -Some criteria applied	<b>BLM</b> -Adds performance criteria <b>FS</b> -Adds performance criteria	<b>BLM</b> -Performance criteria first priority <b>FS</b> -Performance criteria first priority	<b>BLM</b> -No allocations of more forage <b>FS</b> -No allocations of more forage	N.A.
<b>Permit Tenure</b>	<b>BLM</b> -10 yrs. <b>FS</b> -10 yrs.	<b>BLM</b> -10 yrs. <b>FS</b> -10 yrs.	<b>BLM</b> -10 yrs. min.; up to 20 yrs. good stewardship <b>FS</b> -10 yrs. min.; up to 20 yrs. good stewardship	<b>BLM</b> -10 yrs. <b>FS</b> -10 yrs.	<b>BLM</b> -Temporary: up to 1 yr. <b>FS</b> -Temporary: up to 1 yr.
<b>Unauthorized Use</b>	<b>BLM</b> -Three-tiered fee formula; no incidental use <b>FS</b> -Two types, one fee; incidental use	<b>BLM</b> -Three-tiered fee formula; nonmonetary settlement <b>FS</b> -Three-tiered fee formula; nonmonetary settlement	<b>BLM</b> -One fee; nonmonetary settlement <b>FS</b> -One fee; nonmonetary settlement	<b>BLM</b> -Three-tiered fee formula; nonmonetary settlement <b>FS</b> -Three-tiered fee formula; nonmonetary settlement	<b>BLM</b> -Three-tiered fee formula; nonmonetary settlement <b>FS</b> -Three-tiered fee formula; nonmonetary settlement
<b>Nonuse</b>	<b>BLM</b> -Year-to-year, or for 2 yrs. after decision <b>FS</b> -Up to 3 yrs. personal; up to term of permit for resource protection	<b>BLM</b> -Up to 3 yrs. personal; up to 10 yrs. resource protection <b>FS</b> -Up to 3 yrs. personal; up to 10 yrs. resource protection	<b>BLM</b> -Up to 5 yrs. personal; yr. to yr. resource protection <b>FS</b> -Up to 5 yrs. personal; yr. to yr. resource protection	<b>BLM</b> -Automatic, up to 10 yrs. nonuse <b>FS</b> -Automatic, up to 10 yrs. nonuse	N.A.
<b>Suspended Nonuse</b>	<b>BLM</b> -Carry on permit <b>FS</b> -None	<b>BLM</b> - Carry on permit <b>FS</b> -None	<b>BLM</b> -Carry on permit <b>FS</b> -None	<b>BLM</b> -Eliminate <b>FS</b> -None	N.A.

continued...



**Table 2-6 (continued):** Description of the Management Alternatives

<b>Elements</b>	<b>Current Management</b>	<b>Proposed Action</b>	<b>Livestock Production</b>	<b>Environmental Enhancement</b>	<b>No Grazing</b>
<b>Water Rights</b>	<b>BLM</b> -Mixed ownership subject to state law <b>FS</b> -Federal ownership subject to state law	<b>BLM</b> -Federal ownership of new water rights, subject to state law <b>FS</b> -Same as BLM	<b>BLM</b> -Mixed ownership <b>FS</b> -Mixed ownership	<b>BLM</b> -Same as Proposed Action <b>FS</b> -Same as Proposed Action	N.A.
<b>Range Improvement Ownership</b>	<b>BLM</b> -Mixed <b>FS</b> -Federal	<b>BLM</b> -Federal <b>FS</b> -Federal	<b>BLM</b> -Mixed <b>FS</b> -Mixed	<b>BLM</b> -Federal <b>FS</b> -Federal	<b>BLM</b> -Federal <b>FS</b> -Federal
<b>Range Betterment Fund Distribution</b>	<b>BLM</b> -1/2 district of origin, 1/2 Secretarial discretion <b>FS</b> -1/2 forest of origin, 1/2 regional forester discretion	<b>BLM</b> -1/2 district of origin, 1/2 state director discretion <b>FS</b> -1/2 forest of origin, 1/2 regional forester discretion	<b>BLM &amp; FS</b> -All to district of origin	<b>BLM</b> -1/2 district of origin, 1/2 state director discretion <b>FS</b> -1/2 forest of origin, 1/2 regional forester discretion	<b>BLM</b> -No range betterment fund <b>FS</b> -No range betterment fund
<b>Range Betterment Fund Use</b>	<b>BLM</b> -Engineer & build <b>FS</b> -Plan & build	<b>BLM</b> -Plan, engineer, build, & env. assess. <b>FS</b> -Plan, engineer, build, & env. assess.	<b>BLM</b> -Engineer & build <b>FS</b> -Plan & build	<b>BLM</b> -Plan, engineer, build, & env. assess. <b>FS</b> -Plan, engineer, build, & env. assess.	N.A.
<b>Appeals</b>	<b>BLM</b> -Auto. stay upon appeal; full force & effect for resource protection <b>FS</b> -No auto. stay upon appeal for permit admin. decisions	<b>BLM</b> -No auto. stay upon appeal <b>FS</b> -No auto. stay upon appeal for permit admin. decisions	<b>BLM</b> -Auto. stay upon appeal; full force & effect for resource protection <b>FS</b> -No auto. stay upon appeal for permit admin. decisions	<b>BLM</b> -No auto. stay upon appeal <b>FS</b> -No auto. stay upon appeal for permit admin. decisions	N.A.
<b>Grazing Advisory Boards</b>	<b>BLM</b> -Yes <b>FS</b> -No	<b>BLM</b> -Replace w/ resource advisory councils <b>FS</b> -No	<b>BLM</b> -Yes (allow for grazing assoc.) <b>FS</b> -Yes (allow for grazing assoc.)	<b>BLM</b> -Replace w/ resource advisory councils <b>FS</b> -Replace w/ resource advisory councils	N.A.
<b>Suitability</b>	N.A.	N.A.	N.A.	<b>BLM</b> -Sensitive areas nonsuitable <b>FS</b> -Sensitive areas nonsuitable	N.A.

*continued...*





**Table 2-6 (concluded):** Description of the Management Alternatives

Elements	Current Management	Proposed Action	Livestock Production	Environmental Enhancement	No Grazing
<b>Service Charge/ Transaction Fee</b>	<b>BLM</b> -Charges to cover processing <b>FS</b> -Fee for split billing	<b>BLM</b> -Charges to cover processing, including conservation use <b>FS</b> -Charges to cover processing	<b>BLM</b> -None <b>FS</b> -None	<b>BLM</b> -Charges to cover processing <b>FS</b> -Charges to cover processing	<b>BLM</b> -Charges to cover trailing permits <b>FS</b> -Charges to cover trailing permits
<b>Rangeland Ecosystems</b>	<b>BLM</b> -No regs. <b>FS</b> -No regs.	<b>BLM</b> -Regs.; policy implemented thru nat'l requirements and regional stds. and guidelines <b>FS</b> -In regs.	<b>BLM</b> -Consult with grazing advisory boards <b>FS</b> -Consult with grazing advisory boards	<b>BLM</b> -All uses managed to sustain ecosystems <b>FS</b> -All uses managed to sustain ecosystems	N.A.

## Fee Alternatives

Seven fee alternatives are considered in detail in Chapter 2:

- (1) Current PRIA (No Action)
- (2) Modified PRIA
- (3) BLM-Forest Service Proposal (Proposed Action)
- (4) Regional Fees
- (5) Federal Forage Fee
- (6) PRIA with Surcharges
- (7) Competitive Bidding

Thirty-five alternatives could be developed by combining the five management alternatives with the seven fee formulas. For purposes of clarity, the five management alternatives and seven alternative fee formulas are presented separately in this chapter. But, in Chapter 4, Environmental Consequences, each management alternative is combined with each of the seven fees and the cumulative impacts are analyzed (See Analysis of Economic Impacts in Chapter 4 and the Appendixes).

The fee alternatives would apply to all of the Forests Service's western national forests, all national grasslands, and all BLM lands. Historically, the national grasslands had a fee system different from that of the national forests and BLM-administered lands. But under all alternatives except No Action, BLM and the Forest Service in the western states would have identical fees. Fees on National Forest System Lands in the eastern states are not part of any fee alternative. Fees in these areas are currently based on fair market value or competitive bidding.

The fee alternatives could be implemented using one or more of a variety of phase-in options, limits on annual fee changes, and incentives to mitigate economic and other impacts.

For example, the agencies could phase in the competitive bid system by putting up grazing permits for competitive bid as they expire or over some fixed period. The proposed fee alternative would be phased in over a 3-year period. Fee incentive criteria would be developed during the first 2 years of the 3 year fee phase in period. The third year of the phase in would not be implemented until the incentive criteria are developed.

Under all of the grazing fee alternatives except Competitive Bidding, a tiered-fee arrangement could be implemented to provide financial relief to small operators (for example, setting different fee levels for small operators and large operators).



A variety of financial incentives could also be implemented under any of the fee alternatives, except possibly for the Competitive Bidding alternative. Options for an incentive system could be to offer financial credits toward the fee for permittees (1) who participate in monitoring and conducting ecological site inventories of vegetation, (2) whose management has resulted in meeting vegetation objectives for the allotment, (3) who implement management prescriptions for improving the condition of the vegetation on their allotments, or (4) whose management improves vegetation. All of these credits would be authorized for management designed to improve ecosystems. The exact percentage of reduction at each level would be determined by the Secretary of Agriculture and the Secretary of the Interior.

Annual increases or decreases in the grazing fee could be limited to not more than plus or minus a specific percent of the previous year's fee. Such limits would eliminate large annual changes in fees that could cause difficult financial adjustments for permittees. Limits on annual fee changes are already built into the No Action and Proposed Action alternatives.

### Fee Alternative 1: Current PRIA (No Action)

The Current PRIA (No Action) alternative follows the current Executive Order formula (Executive Order 12548, February 14, 1986), which is the Public Rangelands Improvement Act (PRIA) formula with a minimum of \$1.35 per animal unit month (AUM). PRIA defined the results of this formula as fair market value.

The current fee system consists of a base value of \$1.23 per AUM that is then updated annually using three indexes. The base value of \$1.23 was developed from a 1966 study of costs of grazing on public and private leased lands. The study compared the total cost of grazing private leased land, including charges by the landlord, with total cost of grazing on public lands, excluding the federal grazing fee. The difference between this comparison is the amount to be charged, \$1.23, that makes total costs equal. The indexes measure the percent change in forage value (FVI), percent change in beef cattle prices (BCPI), and percent changes in the prices paid for selected items purchased by permittees (PPI). The indexes are assumed

to measure the annual change in the market value of grazing and thereby keep the grazing fee current.

$$\text{Calculated Fee (CF)} = \text{BV} \times \frac{(\text{FVI} + \text{BCPI} - \text{PPI})}{100}$$

Where:

CF=The Calculated Fee to be charged. Annual increase or decreases in the fee are limited to 25 percent of the previous year's fee with a minimum fee of \$1.35.

BV=The base value is \$1.23, established in 1966 through the Western Livestock Grazing Survey.

FVI=The Forage Value Index, an index of annually surveyed private grazing land lease rates for 11 western states (Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming); 1964-1968 = 100.

BCPI=The Beef Cattle Price Index, an index of U.S. Department of Agriculture annually reported prices of beef cattle weighing more than 500 pounds; 1964-1968 = 100.

PPI=The Prices Paid Index, indexed prices that producers of livestock pay for selected production items; 1964-1968 = 100.

The PRIA formula in 1991 resulted in a fee of \$1.97 per AUM and in 1993 a grazing fee of \$1.86 per AUM<sup>1</sup>.

$$\text{As applied: } \$1.86 = \$1.23 \times \frac{(275 + (316 - 440))}{100}$$

Under current regulations, annual increases or decreases in the grazing fee are limited to not more than plus or minus 25 percent of the previous year's fee.

Appendix B, Technical Description of Fee Alternatives, contains a detailed description of the PRIA formula and alternative indexes.

<sup>1</sup> The social and economic impact analysis in Chapter 4 - Environmental Consequences uses 1991 economic data as the basis for analysis. Therefore, the grazing fees identified for comparison under each alternative are what the fee was or would have been in both 1991 and 1993, using the formula proposed under that alternative.



## Fee Alternative 2: Modified PRIA

Alternative 2 would use the same base of \$1.23 as Current PRIA, but would differ from Current PRIA in using an Input Cost Index (ICI) for all production costs (farm and nonfarm) rather than the selected production costs of the Price Paid Index (PPI). Also, the ICI would be divided into the BCPI rather than being subtracted from the BCPI.

$$\text{Fee} = \text{BV} \times \frac{(\text{FVI} \times (\text{BCPI}/\text{ICI}))}{100}$$

Applied as: \$3.69 = \$1.23 X [(275 X (316/290)) / 100]

BV, FVI and BCPI = Same as Alternative 1.

ICI=Input Cost Index (derived from National Prices Paid Index), weighted to reflect all production costs (both farm and nonfarm) for typical cow-calf operations in the western region; 1964-1968 = 100.

For comparison purposes, applying this formula would have resulted in a fee of \$3.52 per AUM in 1991 and \$3.69 per AUM in 1993.

For a more detailed discussion of this alternative, see Appendix B, Technical Description of Fee Alternatives.

## Fee Alternative 3: BLM-Forest Service Proposed Action

Alternative 3 would adopt a fee system using a 1991 base value (\$3.96), updated annually by a Forage Value Index. The \$3.96 base value represents a midpoint in the range of two base values, \$3.25, derived from the 1966 Western Livestock Grazing Survey, and \$4.68, derived from the 1983 federal Land Forage appraisal (updated in 1992). Appendix C, Rationale for the Proposed Grazing Fee Formula, presents a discussion of this alternative.

The 1966 Western Livestock Grazing Survey (WLGS) established a base value of \$1.23 per AUM as the westwide value for public land forage. The WLGS surveyed 10,000 people to determine the nonfee costs of operating on federal lands as compared to operating on private land leases, and the difference of \$1.23 became the base value. Updating the \$1.23 value to 1993 by the change in the private land lease rate re-

sults in a westwide value of \$3.25 per AUM. This value accounts for the nonfee cost differences between leasing private and public land.

The base value of \$4.68 is derived from the 1983 federal Land Forage Appraisal of the value of grazing on lands managed by the Forest Service and BLM in 16 western states (Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Utah, Washington, and Wyoming). Dividing the 16 states into six pricing regions, the appraisal concluded that the value of public land grazing varied from \$4.68 per AUM in the lowest value region (Southwest) to \$8.55 per AUM in the highest value region (Northern Plains).

The 1992 update, based on more data for private grazing lease rates gathered during 1991, found no change in the value of grazing in the lowest value region. The 1991 appraised value of public land grazing varied from \$4.68 per AUM in the Southwest to \$10.26 per AUM month in the Northern Plains.

Appendix B, Technical Description of Fee Alternatives, contains a detailed description of the 1983 appraisal and the 1992 update.

Alternative 3 differs from Alternatives 1 and 2 in having a different base value and in having a Forage Value Index (FVI) for 17 western states rather than 11 western states.

$$\begin{aligned}\text{Fee} &= \text{BV} \times \text{FVI}; \\ \text{BV} &= \text{Base Value of } \$3.96\end{aligned}$$

FVI=Forage Value Index is the weighted average of the prior year's PGLLR per AUM for pasturing cattle on private rangelands in each of the 17 contiguous western states (Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming), divided by the weighted average of the PGLLR per AUM for pasturing cattle in the year 1996 in each of the 17 contiguous western states. The weighted averages are calculated by multiplying the PGLLR for each of the 17 states by the number of public AUMs sold on public rangelands, National Forests and National Grasslands in each of the states during the respective years and dividing the total number of public AUMs sold in the 17 western states in the respective years. See Appendix D, Private Grazing Land Lease Rates.



A base value of \$3.96 per animal unit month (AUM) is proposed in this alternative. This value represents a midrange between the results obtained through the use of two methods for estimating a fair base value. Explanation of the methodology used in arriving at the \$3.96 base value is presented in Appendix C. The proposed fee would be phased in over the years 1995 through 1997. Thereafter, annual increases or decreases in the grazing fee resulting from changes in the forage value index would be limited to 25 percent of the amount charged the previous year to provide for a measure of stability that would facilitate business planning. An economic analysis of the impacts of the fee increase will be conducted during the phase-in period. Decisions on full implementation of the fee increase will be re-evaluated based on that economic analysis.

In preparation for the development of an incentive-based fee, a provision has been included in the Proposed Action that would substitute a base value of \$3.50, beginning in the year 1997, in the event that the Department has not completed a separate rulemaking establishing criteria and procedures for the implementation of an incentive fee formula. The incentive would be a 30 percent discount from the fee calculated using the proposed \$3.96 base value.

This proposal would establish 1996 as the base year for the forage value index. The forage value index would not be used to annually adjust the fee in response to market conditions until the year 1997. This proposed rule would establish the 1995 grazing fee at \$2.75, and the 1996 grazing fee at \$3.50. Thereafter the fee would be calculated, using the base value of \$3.96 multiplied by the revised forage value index. By definition, the forage value index in the year 1997 would equal one; yielding a 1997 grazing fee of \$3.96. In subsequent years the calculated fee would depend on the changes in the market rate for private grazing land leases as reflected by the forage value index.

This change in the derivation of the forage value index is proposed to reduce the uncertainty in the fee in the immediate future that resulted from using a forage value index based on less current private land lease rate data. Under the proposal presented in the advance notice of proposed rulemaking, the fee would have been adjusted annually by a forage value index based on the average price paid for private graz-

ing in the years 1990 through 1992. Assuming that forage value index would have remained constant until the end of the phase in period provided in the advance notice, the formula would have yielded a grazing fee of \$4.28 per AUM as compared to a 1997 fee of \$3.96 per AUM using the revised forage value index.

## Fee Alternative 4: Regional Fees

This fee formula that would be applied by Alternative 4 is the same as for the Proposed Action (Alternative 3), except that a different base value (base year 1991) would be applied to each of six pricing regions, and each base value would be updated annually by the westwide Forage Value Index. All BLM and Forest Service permittees within a region would pay the same fee. Map 2-1 shows westwide pricing areas, the basis for this alternative.

The regional base values would be derived from the 1983 federal land forage appraisal (updated in 1992) of the value of grazing on lands managed by the Forest Service and BLM in 16 western states (Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Utah, Washington, and Wyoming). Dividing the 16 states into six pricing regions, the appraisal concluded that the value of public land grazing varied from \$4.68 per AUM in the lowest value region (the Southwest) to \$8.55 per AUM in the highest value region (the Northern Plains).

The 1992 update, based on more data for private grazing lease rates gathered during 1991, found no change in the value of grazing in the lowest value region. The 1991 appraised value of public land grazing varied from \$4.68 per AUM in the Southwest to \$10.26 per AUM in the Northern Plains.

Appendix B, Technical Description of Fee Alternatives, contains a detailed description of the 1983 appraisal and the 1992 update.

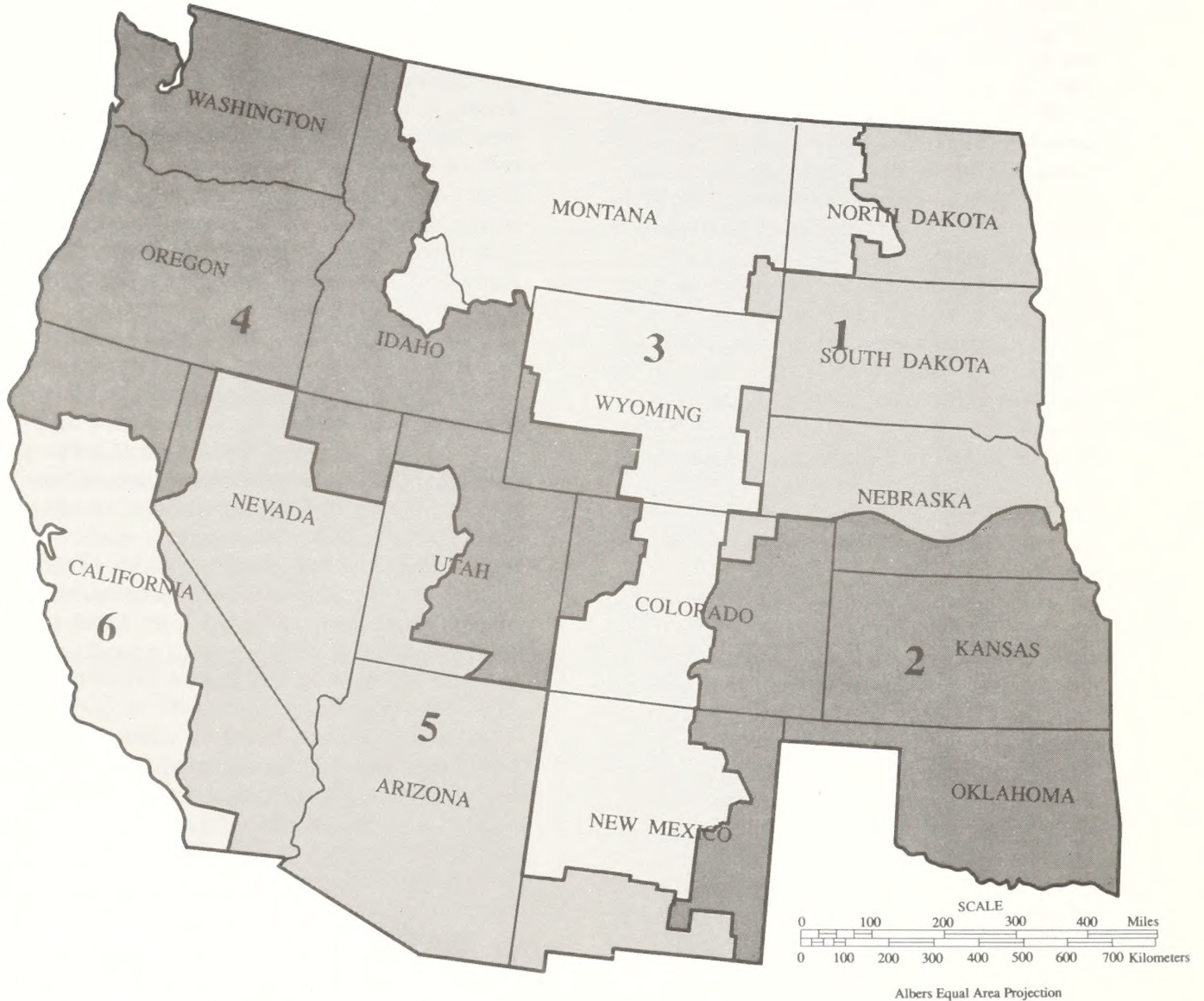
$$\text{Fee}_{\text{Region } i} = \text{BV}_{\text{Region } i} \times \text{FVI}$$

$$i = 1 \text{ through } 6$$

BV in Region 1 = \$10.26; Region 2 = \$6.39; Region 3 = \$7.74; Region 4 = \$6.39; Region 5 = \$4.68; Region 6 = \$6.85. (See Figure 2-2 for a map of these regions.)



## Map 2-1. Westwide Pricing Areas





For comparison purposes, applying the formula would have resulted in the following fees:

Region	1991 Projected Fee	1993 Projected Fee
1	\$10.26	\$11.08
2	6.39	6.90
3	7.74	8.36
4	6.39	6.90
5	4.68	5.05
6	6.85	7.40

### Fee Alternative 5: Federal Forage Fee

Alternative 5, called the Federal Forage Fee formula by the group suggesting this system (The Western Livestock Producers Alliance), is based on the 3-year average of the weighted average of private grazing land lease rates for the 16 western states (WALLPR). The WALLPR is multiplied by the ratio of the 1966 Western Livestock Grazing Survey (WLGS) private land lease rate to the 1964-1968 base year private land lease rate (PrLFVR). Then the updated 1966 nonfee cost differential (NFCD) is deducted. Finally that residual is multiplied by the percentage that cash receipts per cow for federal permittees is of the cash receipts per cow for nonfederal livestock producers (NPD). The fee would be calculated each year using a 3-year rolling average of the private land lease rate.

$$\text{Grazing fee} = ((\text{WAPLLR} \times \text{PrLFVR}) - \text{NFCD}) \times \text{NPD}$$

$$\text{Applied as: } \$2.32 = ((8.67 \times .488) - 1.59) \times .879$$

This alternative assumes the difference between the National Agricultural Statistics Service's private grazing land lease rate and the private land lease rate determined in the 1966 Western Livestock Grazing Survey results from infrastructure and service differences. It assumes that subtracting the nonfee cost differential from the private grazing land lease rate is as valid in 1993 as it was in 1966. The alternative further makes a third downward adjustment for productivity, defined as the difference in the cash receipts of permittees and nonpermittees.

For purposes of comparison, applying this formula would have resulted in a fee animal unit

of \$2.36 in 1993. For each year the fee would not differ by more than 25 percent of the fee charged in the previous year.

Note: Exact data used by the developers of this alternative is not available and therefore the application of the formula as shown results in a value of \$2.32 rather than \$2.36 the developers used. The value of \$2.36 is used for all evaluations of this alternative.

Appendix E, Description of Grazing Fee Alternatives Submitted by Western Livestock Producers Alliance and High Country Citizens Alliance, contains the complete text for this alternative.

### Fee Alternative 6: PRIA with Surcharges

Alternative 6 would use the fee produced by the Public Rangelands Improvement Act (PRIA) formula as a base value and add a surcharge to cover the cost of administering the grazing program at the local Forest Service and BLM administrative level. The fee would be limited each year to twice the fee produced by the PRIA formula. After a 1 year phase-in, the surcharge would be limited to a 10 percent increase or decrease from the previous year's surcharge. The PRIA fee is discussed in detail in Alternative 2.

$$\text{Fee} = \text{PRIA fee} + \text{Administrative Cost Surcharge}$$

One of the main objectives of this alternative is to raise funds to cover the local cost of administration. The fee would vary from area to area depending on the cost of administering the grazing program, but it would not vary on the basis of the forage's value.

For comparison purposes, applying this formula and assuming the administrative cost surcharge would result in a fee between \$1.97 to \$3.94 per animal unit month in 1991 and between \$1.86 to \$3.72 in 1993. For evaluation purposes the 1993 maximum fee of \$3.72 is used.

Appendix E, Description of Grazing Fee Alternatives Submitted by Western Livestock Producers Alliance and High Country Citizens Alliance, contains the complete text for this alternative.



## Fee Alternative 7: Competitive Bidding

Under Alternative 7, competitive bidding would be used to set grazing fees for livestock grazing. Under the terms of the permit, the successful bidder would be required to perform specific management practices and facilities maintenance. The terms of the permit would be part of the bid process, allowing bidders to estimate the market value of the forage to themselves with the permit requirements.

A competitive bidding system could be implemented through several options. One option would be to limit competitive bidding to vacant allotments and allotments acquired through land exchanges. Other options include competitive bidding for long- and short-term permits. For example, long-term competitive bidding could be used to establish grazing fees for 10-year term permits for established allotments. The successful bidders' fees over the life of the contract lease might be adjusted through use of the Forage Value Index or other adjustments, such as an index that reflects the price of hay or other livestock feed substitutes.

Short-term competitive bidding would generally follow the same procedures as long-term

competitive bidding except that permits would be issued for 2- to 5-year terms, and the bid price would not be adjusted for market changes during the permit period.

These options would be phased in over time, beginning with vacant and new allotments. As existing 10-year-term permits expire, new fees could be established through competitive bidding. Permittees on record could match the highest bid.

For evaluation purposes a fully implemented competitive bidding system is estimated using the appraised values for the pricing regions as described in Alternative 4.

To implement competitive bidding, legislation may be needed for permittees who are not the highest bidders and would lose their grazing preference established by the Taylor Grazing Act. But legislation may not be needed for permittees who voluntarily give up their grazing preferences or where no preference has been established, such as on allotments newly acquired through land exchanges.

## Comparison of Fee Alternatives

See Table 2-7 for a comparison of the fee alternatives. Figures 2-1 and 2-2 compare the actual fees by alternative.

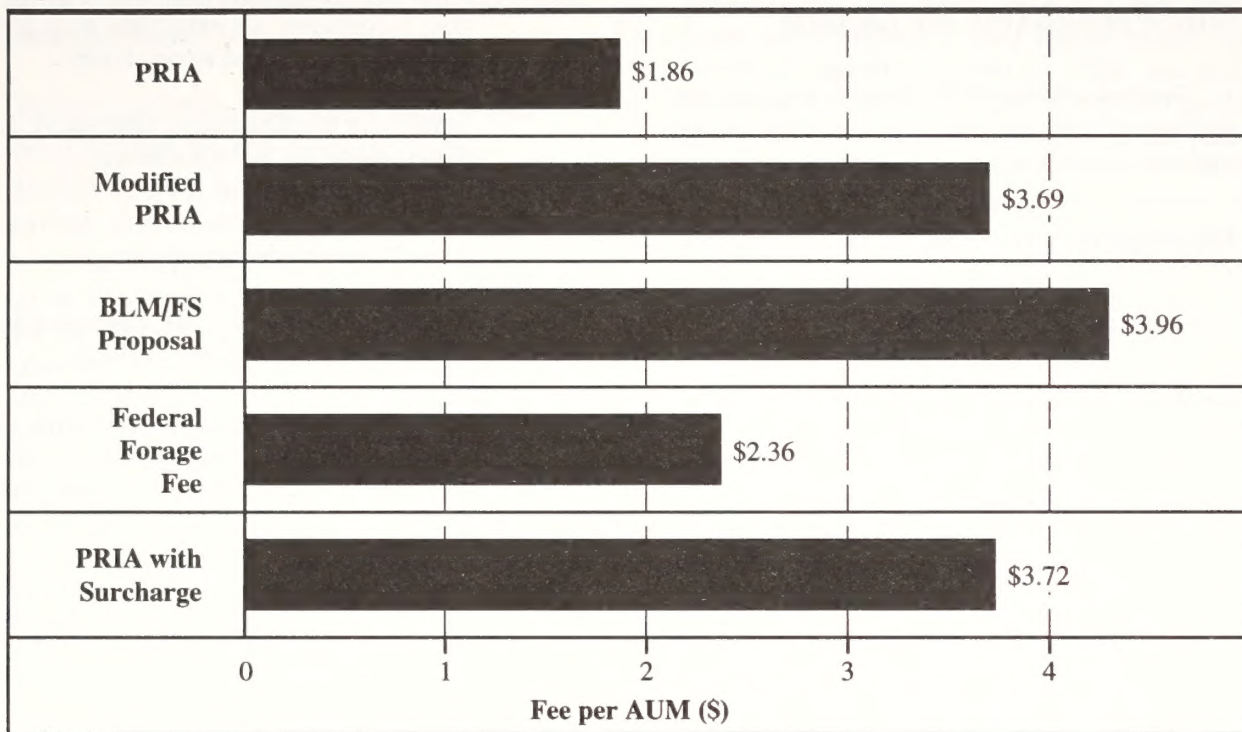
**Table 2-7: Description of Fee Alternatives**

Elements	PRIA	Modified PRIA	BLM-FS Proposal	Regional Fees	Federal Forage Fee	PRIA with Surcharge	Competitive Bidding
Base Value	\$1.23	\$1.23	\$3.96	\$4.68-\$10.26	3-yr. avg.	PRIA (\$1.23)	None
Minimum Fee	\$1.35	\$1.23	\$3.96	\$4.68-\$10.26	3-yr. avg.	PRIA (\$1.35)	Market driven
Factors Affecting Fee	BV FVI BCPI PPI	BV FVI BCPI PPI	BV FVI	Regional BV FVI	WAPLLR NFCD PrLFVR NPD	PRIA fee, Admin. Surcharge	Demand
Maximum Annual Fee Variation	25%	25%	25%	25%	25%	Fee: 2 x PRIA Surcharge 10%	Would vary
1993 Calculated Fee	\$1.86	\$3.69	\$4.28	\$5.05-\$11.08	\$2.36	\$3.72	Would vary

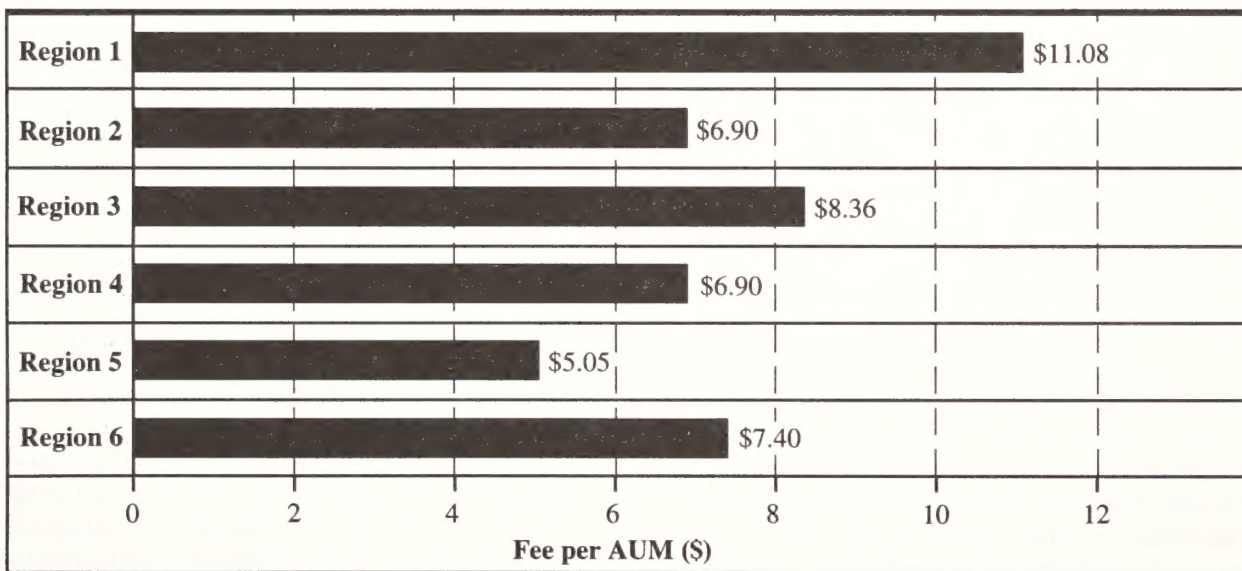
**BV**=Base Value; **FVI**=Forage Value Index; **BCPI**=Beef Cattle Price Index; **PPI**=Prices Paid Index  
**ICI**=Input Cost Index; **WAPLLR**=Weighted Average of Private Land Lease Rates  
**PrLFVR**=Ratio of WLGs Private Land Lease Rate to 1964-68 Base Year Private Land Lease Rate  
**NFCD**=Nonfee Cost Differential; **NPD**=Ratio of Federal Permittee Cash Receipts to Nonfederal Producers Cash Receipts; **PRIA**=Public Rangelands Improvement Act



**Figure 2-1: Alternative Fees, 1993 Levels**



**Figure 2-2: Alternative Fees by Region, 1993 Prices**



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## ***Alternatives Considered But Not Presented in Detail***

Several alternatives were evaluated but eliminated from detailed consideration for reasons discussed below.

### **Management Alternatives**

#### **Maximum Production**

The Maximum Production alternative would be more favorable to the livestock industry than would Current Management. Under this alternative, both agencies would work to increase the economic return of the industry and establish livestock grazing as the dominant use on federal lands.

Functioning independently of other sectors of the public, grazing advisory boards would be retained to manage the allocation of all Range Betterment Funds and direct and set priorities for BLM and Forest Service rangeland management. Range Betterment Funds would be used only for livestock-related purposes. Vegetation would be managed for the greatest livestock weight gain and health. If necessary, riparian and upland areas would be open to livestock grazing all year. Areas now under different management would also be opened if permittees so desired. Grazing fees would be set artificially low to maximize profits, and public rangelands could be subleased for the same reason.

The goal of Maximum Production is to allow the most red meat production and greatest economic benefit to ranchers and livestock owners.

Maximum Production is not considered in detail because it does not meet the purpose and need, and many of its components are in other alternatives that are considered in detail. This would make the analysis of this alternative unnecessary, redundant, and repetitive.

The following issues related to Maximum Production are addressed and analyzed in one or more of the alternatives considered in detail:

- Standards and guidelines (the lack of) are addressed in Alternative 1 (Current Management).

- Permit Tenure is addressed in Alternative 3 (Livestock Production). Alternative 3 considers an extension to a 20-year term with good stewardship.
- Suitability is addressed in Alternative 2, (Environmental Enhancement).
- Water rights are addressed in Alternatives 3 (Livestock Production).
- Foreign Corporations are addressed in Alternative 2 (Proposed Action).
- Range Betterment Fund distribution and use are addressed and analyzed in detail in Alternative 4 (Environmental Enhancement).
- Service Charge/Transaction Fee would be the same as under Alternative 3 (Livestock Production).

### **Fee Alternatives**

#### **Private Land Lease Rate**

Public land grazing fees equal to the previous year's private grazing land lease rate have not been analyzed in detail. The private grazing land lease rate is an indicator of value and of changes in market value that is used often in this analysis. The private grazing land lease rate does not directly reflect the value of public forage because of the differences in the costs of using public lands for grazing.

#### **Owyhee Cattlemen's Association/ Owyhee County Proposal**

This alternative would set the federal grazing fee at 19.1 percent of the annual 11-state average private grazing land lease rate (PGLLR). The 19.1 percent is determined by dividing the federal grazing fee (set by the Public Rangelands Improvement Act) by the PGLLR over the past 15 years. The 15-year average federal grazing fee is 19.1 percent of the 11-state average PGLLR. Because elements of this alternative—the current PRIA grazing fee formula and tying the grazing fee to the rate of change in the private grazing



land lease rate—appear in alternatives analyzed in this EIS, this alternative has not been analyzed in detail.

### **Weighted-Average Appraisal Value Multiplied by the Forage Value Index (1991 Base Value = \$6.38)**

This alternative, which sets the base value as the average of the appraisal values established for the six pricing regions in the 1992 appraisal update (weighted by the amount of public grazing), has not been analyzed in detail. The base value of \$6.38 exceeds the appraised value of \$4.68 in the lowest value region (the Southwest), location of about 33 percent of the total livestock forage on BLM- and Forest Service-administered lands. Consequently, this alternative is not considered feasible.

## ***Implementation***

The decisions resulting from the analysis in this EIS may be implemented in a variety of ways: new or amended legislation, executive order, rulemaking, agency directives, interagency agreements, land use planning, and regional or site-specific analyses. The choice of implementation methods will depend on the nature of the alternative selected and other considerations such as cost, timeliness, and effectiveness.

Both the Forest Service and BLM intend to jointly recognize identical ecoregions to facilitate ecosystem management. A modification of R.G. Bailey's Ecoregions of the United States (Bailey 1980), these ecoregions would serve as the basis for the developing BLM regional standards and guidelines.

In the interim, before the formal recognition of these ecoregions, the two agencies would need to consider existing administrative boundaries. At the least, BLM would develop regional standards and guidelines within each state in cooperation with the Forest Service. BLM standards and guidelines would be developed in consultation with resource advisory councils and other federal and state land management and regulatory agencies.

To meet national requirements, BLM would develop state or regional standards and guidelines and complete a plan conformance test within 18 months, subject to NEPA and BLM planning regulations. All standards and guidelines that conform to existing land use plans would be implemented immediately. For standards and guidelines that do not conform to existing land use plans, BLM would begin a plan amendment process with NEPA analysis. Any additional NEPA compliance would tier to the analysis of the national requirements and standards and guidelines presented in this EIS. Any additional NEPA work would be at the appropriate level (that is, none, categorical exclusion, environmental assessment, or environmental impact statement, adopting other NEPA work, etc.), depending on plan conformance determinations and previous NEPA work.

If at the end of 18 months regional standards and guidelines have not been developed, the fallback standards and guidelines would be implemented immediately subject to the plan conformance test and NEPA compliance described for the regional standards and guidelines. The Forest Service establishes or amends standards and guidelines for rangeland management in forest plans for individual forests.

Annual grazing authorizations and renewal of permits and leases would be contingent upon adherence to terms. Failure to comply could result in authorized livestock grazing being reduced or the permit being canceled.

Implementation actions would be evaluated to determine their potential effect on federally listed threatened and endangered species, species proposed for listing, or designated or proposed threatened or endangered critical habitats. Before implementing actions that might affect listed or proposed species, the agencies will consult with the Fish and Wildlife Service or the National Marine Fisheries Service as required by Section 7 of the Endangered Species Act. When feasible, BLM and the Forest Service will conduct this consultation using an ecosystem or species rangewide approach.

Table 2-8 shows policy and regulation changes for the actions proposed by each alternative except Current Management.





**Table 2-8: Implementation Requirements for the Management Alternatives (other than Current Management)**

<b>Change Agent</b>	<b>Proposed Action</b>	<b>Livestock Production</b>	<b>Environmental Enhancement</b>	<b>No Grazing</b>
<b>Standards and Guidelines</b>	BLM-Regulation Change FS-Policy Change	BLM-Policy Change FS-No Change	BLM-Policy Change FS-Policy Change	BLM-No Change FS-No Change
<b>Leasing</b>	BLM-Regulation Change FS-No Change	BLM-Regulation Change FS-Regulation Change	BLM-Regulation Change FS-No Change	BLM-Regulation Change FS-No Change
<b>Foreign Corporation</b>	BLM-No Change FS-Regulation Change	BLM-Legislation FS-Legislation	BLM-No Change FS-Regulation Change	BLM-Regulation Change FS-Regulation Change
<b>Disqualification</b>	BLM-Regulation Change FS-Regulation Change	BLM-Regulation Change FS-Regulation Change	BLM-Regulation Change FS-Regulation Change	BLM-Regulation Change FS-Regulation Change
<b>Prohibited Acts</b>	BLM-Regulation Change FS-No Change	BLM-No Change FS-No Change	BLM-Regulation Change FS-No Change	BLM-Regulation Change FS-No Change
<b>Grant Policy</b>	BLM-Regulation Change FS-Policy Change	BLM-Regulation Change FS-Policy Change	BLM-Regulation Change FS-Policy Change	BLM-Regulation Change FS-Policy Change
<b>Permit Tenure</b>	BLM-No Change FS-No Change	BLM-Change in FLPMA FS-Change in NFMA	BLM-No Change FS-No Change	BLM-Regulation Change FS-Regulation Change
<b>Unauthorized Use</b>	BLM-Regulation Change FS-Regulation Change	BLM-Regulation Change FS-Regulation Change	BLM-Regulation Change FS-Regulation Change	BLM-No Change FS-No Change
<b>Nonuse</b>	BLM-Regulation Change FS-No Change	BLM-Regulation Change FS-Regulation Change	BLM-Regulation Change FS-Regulation Change	BLM-Regulation Change FS-Regulation Change
<b>Suspended Nonuse</b>	BLM- No Change FS-N.A.	BLM-No Change FS-N.A.	BLM-Regulation Change FS-N.A.	BLM-Regulation Change FS-N.A.
<b>Water Rights</b>	BLM-Policy Change FS-No Change	BLM-No Change FS-Policy Change	BLM-Policy Change FS-No Change	BLM-Policy Change FS-No Change
<b>Range Improvement Ownership</b>	BLM-Regulation Change FS-No Change	BLM-No Change FS-Policy Change	BLM-Policy Change FS-No Change	BLM-Policy Change FS-No Change
<b>Range Betterment Fund Distribution</b>	BLM-Policy Change FS-No Change	BLM-Policy Change FS-Policy Change	BLM-Regulation Change FS-No Change	BLM-Policy Change FS-Policy Change
<b>Range Betterment Fund Use</b>	BLM-Regulation Change FS-Policy Change	BLM-No Change FS-No Change	BLM-Regulation Change FS-Policy Change	BLM-Regulation Change FS-Regulation Change

*continued...*



**Table 2-8 (concluded):** Implementation Requirements for the Management Alternatives  
(other than Current Management)

<b>Change Agent</b>	<b>Proposed Action</b>	<b>Livestock Production</b>	<b>Environmental Enhancement</b>	<b>No Grazing</b>
<b>Appeals</b>	BLM-Regulation Change FS-No Change	BLM-No Change FS-No Change	BLM-Regulation Change FS-No Change	BLM-No Change FS-No Change
<b>Grazing Advisory Boards</b>	BLM-Regulation Change FS-Regulation Change	BLM-Regulation Change FS-Legislation	BLM-Regulation Change FS-Regulation Change	BLM-Regulation Change FS-Regulation Change
<b>Suitability</b>	BLM-No Change FS-No Change	BLM-No Change FS-No Change	BLM-Legislation FS-Legislation	BLM-No Change FS-No Change
<b>Service Charge/ Transaction Fee</b>	BLM-Regulation Change FS-Regulation Change	BLM-Regulation Change FS-Policy Change	BLM-No Change FS-Regulation Change	BLM-Regulation Change FS-Regulation Change
<b>Rangeland Ecosystems</b>	BLM-Regulation Change FS-Regulation Change	BLM-Policy Change FS-Policy Change	BLM-Policy and Regulation Change FS-Policy and Regulation Change	BLM-Policy Change FS-Policy Change

## *Comparison of Impacts*

Table 2-9 and Figures 2-3 through 2-10 compare the impacts of the Proposed Action and alternatives. Although these impacts are described

in detail in Chapter 4, Environmental Consequences, the table and figures are provided to assist decisionmakers and reviewers by concisely summarizing the major impacts and presenting them in comparative form.





**Table 2-9: Summary of Impacts**

Environmental Factor	Current Management	Proposed Action	Livestock Production	Environmental Enhancement	No Grazing
<b>Climate</b>	Climate will not be affected by any alternative.				
<b>Air Quality</b>	Air quality would not be significantly affected under any alternative. Locally, all alternatives would affect air quality because of vegetation treatments applied as part of rangeland management, including prescribed burning, mechanical treatments, and chemical applications. Such impacts would tend to be temporary, small in scale, and widely dispersed.				
<b>Vegetation and Watershed Conditions</b>	<p>On BLM lands, the amount of inventoried upland vegetation in late seral and potential natural communities would increase by 11 percent (from 31.8 to 35.3 million acres) over the long term. The upward trend on BLM upland vegetation would increase by 10 percent (from 28.4 to 31.3 million acres). On Forest Service lands, the amount of upland vegetation meeting or moving toward forest plan objectives would increase by 2 percent (from 58.9 to 59.9 million acres). Most improvement in upland vegetation conditions would occur in areas receiving more than 12 inches of precipitation annually. (See Figure 2-3.)</p>	<p>On BLM lands, the amount of inventoried upland vegetation in late seral and potential natural communities would increase by 16 percent (to 36.9 million acres) over the long term. The upward trend on BLM upland vegetation would increase by 21 percent (to 34.3 million acres). On Forest Service-administered lands, upland vegetation meeting or moving toward forest plan objectives would increase by 2 percent (to 60.2 million acres). Most improvement in upland vegetation conditions would occur in areas receiving more than 12 inches of precipitation.</p>	<p>On BLM lands, the amount of inventoried upland vegetation in late seral and potential natural communities would increase by 21 percent (to 37.8 million acres) over the long term. The upward trend on BLM upland vegetation would increase by 15 percent (to 32.8 million acres). On Forest Service administered lands, upland vegetation meeting or moving towards forest plan objectives would be the same as the proposed action. Most of the improvement in upland vegetation condition would occur in areas receiving more than 12 inches of precipitation.</p>	<p>On BLM lands, the amount of inventoried upland vegetation in late seral and potential natural communities would increase by 24 percent (to 39.4 million acres) over the long term. The upward trend on BLM upland vegetation would show a 25 percent increase (to 35.4 million acres). On Forest Service administered lands, upland vegetation meeting or moving towards forest plan objectives would increase by 18 percent (to 69.4 million acres). Most improvement in upland vegetation conditions would occur in areas receiving more than 12 inches of precipitation.</p>	<p>On BLM lands, the amount of inventoried upland vegetation in late seral and potential natural communities would increase by 27 percent (to 40.4 million acres) over the long term. The upward trend on BLM upland vegetation would show only an 8 percent increase (to 30.6 million acres), a result of removing grazing from ecosystems or vegetation zones that evolved under grazing pressure. But as both agencies more rigorously apply ecosystem management principles, local use of livestock grazing to simulate ecological processes may gradually increase. Vegetation conditions and trends would change only slightly if at all in areas dominated by shrubs or pinyon-juniper, even over the long term. On Forest Service administered lands, upland vegetation meeting or moving towards forest plan objectives would be the same as the environmental enhancement alternative. Most improvement in upland vegetation conditions would occur in areas receiving more than 12 inches of precipitation.</p>

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*continued...*



**Table 2-9 (continued): Summary of Impacts**

Environmental Factor	Current Management	Proposed Action	Livestock Production	Environmental Enhancement	No Grazing
<p><b>Vegetation and Watershed Conditions (continued)</b></p>	<p>In the long term, about 117,000,000 million acres of BLM uplands would be in proper functioning condition, 22,000,000 acres would be functioning but susceptible to degradation; and another 20,000,000 would be nonfunctioning. (See Figure 2-4.)</p> <p>In spite of an 18 percent decline in livestock AUMs on lands administered by both agencies (Figure 2-5 and Figure 2-6) and the later improvement of upland vegetation conditions (Figure 2-4), BLM riparian areas would continue to decline (Figure 2-7).</p> <p>In the long term, 33 percent of BLM riparian areas would be properly functioning, a decrease of 3 percent from 1993. Another 45 percent would be functioning but susceptible to degradation, a decrease of less than 1 percent from 1993. About 21 percent would be nonfunctioning, an increase of 7 percent from 1993.</p> <p>On Forest Service-administered lands (Figure 2-8), riparian areas meeting or moving toward forest plan objectives would decrease by 1 percent (from 1.71 million to 1.64 million acres).</p>	<p>In the long term, about 138,000,000 million acres of BLM uplands would be in proper functioning condition, 6,000,000 acres would be functioning but susceptible to degradation; and another 15,000,000 would be nonfunctioning.</p> <p>In the long term, 43 percent of BLM riparian areas would be properly functioning, an increase of 27 percent from 1993. Another 41 percent would become functioning but susceptible to degradation, a decrease of 11 percent from 1993. About 16 percent would be nonfunctioning, a decrease of 20 percent from 1993.</p> <p>On Forest Service-administered lands, riparian areas that meet or are moving toward forest plan objectives would increase by 7 percent (to 1.83 million acres) over the long term.</p>	<p>In the long term, about 129,000,000 million acres of BLM uplands would be in proper functioning condition, 12,500,000 acres would be functioning but susceptible to degradation; and another 17,500,000 would be nonfunctioning.</p> <p>In the long term, 32 percent of BLM riparian areas would be properly functioning, a decrease of 8 percent from 1993. Another 45 percent would become functioning but susceptible to degradation, a decrease of 2 percent from 1993. About 24 percent would be nonfunctioning, an increase of 18 percent from 1993.</p> <p>On Forest Service-administered lands, riparian areas that meet or are moving toward forest plan objectives would decrease by 11 percent (to 1.53 million acres) over the long term.</p>	<p>In the long term, about 151,000,000 million acres of BLM uplands would be in proper functioning condition, 0 acres would be functioning but susceptible to degradation; and another 8,000,000 would be nonfunctioning.</p> <p>In the long term, about 59 percent of BLM riparian areas would be properly functioning, an increase of 71 percent from 1993. Another 32 percent would become functioning but susceptible to degradation, a decrease of 30 percent from 1993. About 9 percent would be nonfunctioning, a decrease of 53 percent from 1993.</p> <p>On Forest Service-administered lands, riparian areas that meet or are moving toward forest plan objectives would increase by 28 percent (to 2.19 million acres) over the long term.</p>	<p>In the long term, about 151,000,000 million acres of BLM uplands would be in proper functioning condition, 0 acres would be functioning but susceptible to degradation; and another 8,000,000 would be nonfunctioning.</p> <p>In the long term, 65 percent of BLM riparian areas would be properly functioning, an increase of 91 percent from 1993. Another 28 percent would become functioning but susceptible to degradation, a decrease of 38 percent from 1993. About 6 percent would be nonfunctioning, a decrease of 68 percent from 1993.</p> <p>On Forest Service-administered lands, riparian areas that meet or are moving toward forest plan objectives would increase by 28 percent (to 2.19 million acres) over the long term.</p>

*continued...*





**Table 2-9 (continued): Summary of Impacts**

Environmental Factor	Current Management	Proposed Action	Livestock Production	Environmental Enhancement	No Grazing
<b>Vegetation and Watershed Conditions</b> <i>(continued)</i>	<p>The level of forage authorized for livestock by both agencies would decline by 18 percent</p>	<p>Improvements would result mainly from implementing standards and guidelines (BLM), ecosystem management, modified livestock management practices, and increased public involvement in managing rangeland resources.</p> <p>The level of forage authorized for livestock by both agencies would decline by 21 percent.</p>	<p>Improvements would result from implementing regional (BLM) and local (Forest Service) standards and guidelines, which would tend to focus on livestock forage and upland watershed conditions and somewhat less on other resources. Implementing regional and local BLM standards and guidelines would continue inconsistencies between BLM and Forest Service resource management.</p> <p>Although forage authorized for livestock by both agencies would decrease by 11 percent, overall riparian resource conditions would continue to decline.</p>	<p>Improvements would result from implementing standards and guidelines for both agencies. Applying standards and guidelines would limit livestock grazing to areas in proper functioning condition. Later regional standards and guidelines would ensure that ecosystem management objectives are met. Having a greater productive potential, riparian areas would improve faster than uplands.</p> <p>Forage authorized by both agencies for livestock would decline by 31 percent.</p>	<p>Forage authorized for livestock by both agencies would decline by essentially 100 percent.</p>
<b>Wildlife</b>	<p>Upland-dependent wildlife would generally benefit from changes in upland plant communities. Fish and other wildlife associated with riparian areas would continue to decline as riparian habitat conditions continue to deteriorate. Locally, riparian habitat conditions would continue to improve in allotments where changes in livestock management can be or have recently been implemented.</p>	<p>Both upland and riparian-dependent wildlife would benefit from projected improvements in vegetation and watershed conditions. Upland species that favor or rely upon late seral and potential natural communities would benefit more than species that favor earlier seral stages.</p>	<p>Upland-dependent wildlife would generally benefit from changes in upland plant communities. Upland species that favor or rely upon late seral and potential natural communities would benefit more than species that favor earlier seral stages.</p> <p>Fish and other wildlife species associated with riparian areas would continue to decline as riparian habitat conditions continued to deteriorate.</p>	<p>Both upland and riparian-dependent wildlife would benefit from improvements in vegetation and watershed conditions. Upland species that favor or rely upon late seral and potential natural communities would benefit more than species that favor earlier seral stages. Most wildlife benefits would result from limiting livestock grazing to areas in proper functioning condition.</p>	<p>Both upland and riparian-dependent wildlife species would benefit from improvements in vegetation and watershed conditions. Upland species that favor or rely upon late seral and potential natural communities would benefit more than species that favor earlier seral stages.</p>

*continued...*



**Table 2-9 (continued): Summary of Impacts**

Environmental Factor	Current Management	Proposed Action	Livestock Production	Environmental Enhancement	No Grazing
<p><b>Special Status Species</b></p>	<p>In general, special status species associated with upland vegetation would benefit from improvements in upland conditions. Some species might be restored or recover although the status of individual species would continue to highly depend on many factors (such as the implementing of interagency recovery plans). Special status species that depend on riparian habitat would probably continue to decline, and new species might become threatened or endangered. But continued consultation with the Fish and Wildlife Service and more rigorous implementing of ecosystem management practices should minimize such declines on BLM and national forest lands.</p>	<p>In general, special status species associated with both upland and riparian vegetation would benefit from improvements in conditions. Some species might be restored or recover, although the status of individual species would continue to highly depend on many factors (such as implementing interagency recovery plans).</p>	<p>Special Status Species favoring upland range conditions that are improved for livestock production would benefit. Others would continue to decline. Special status species that depend on riparian habitat would probably continue to decline, and new species might become threatened or endangered. But continued consultation with the Fish and Wildlife Service and more rigorous implementing of ecosystem management practices should help mitigate or reduce such declines.</p>	<p>In general, special status species associated with both upland and riparian vegetation would benefit from improved conditions. Some species might be restored or recovered, although the status of individual species would continue to be highly dependent on many factors (such as implementing interagency recovery plans). Some listed species would benefit from excluding livestock, particularly in riparian areas.</p>	<p>Generally, special status species associated with both upland and riparian vegetation would benefit from improved conditions. Some species might be restored or recover, although the status of individual species would continue to high depend on many factors (such as implementing interagency recovery plans). Some listed species would benefit from excluding livestock, particularly in riparian areas.</p>
<p><b>Grazing Administration</b></p>	<p>Nonuse has been authorized annually for operator convenience or resource protection. In BLM, grazing decisions are automatically stayed from implementation until any appeals are resolved. Forest Service decisions related to grazing permit compliance are not automatically stayed upon appeal. Forest Service decisions made through the NEPA process are stayed for 45 days if appealed. Persons may appeal a decision merely to delay its implementation. Appeals create a significant administrative workload for both agencies. Since each state has its own BLM policy to determine public participation procedures, inconsistencies have</p>	<p>The agencies would become more consistent in applying grazing policies and regulations. Inconsistencies would remain in regulations relating to leasing and advisory groups. BLM efficiency would improve with regulation changes related to base property leases, livestock pasturing agreements, unauthorized use, appeal of grazing decisions, range improvement ownership, disqualification, and implementation of ecosystem management by applying standards and guidelines. The Forest Service would gain improved efficiency and consistency related to unauthorized use, foreign corporation eligibility for holding</p>	<p>Changes in grazing regulations regarding standards and guidelines, nonuse, grazing advisory boards, and range improvement ownership would allow BLM and the Forest Service to more efficiently administer their rangeland programs.</p> <p>Changes in administrative processes for unauthorized use, use of Range Betterment Funds, and resource decisions would hinder efficiency in meeting resource management objectives. Grazing transfers on Forest Service-administered lands would significantly increase due to increased leasing of base property and livestock. BLM and Forest</p>	<p>Under this alternative, BLM and Forest Service regulations would be consistent. This consistency, combined with common standards and guidelines, would help both agencies implement ecosystem management. BLM would no longer issue base property or livestock leases. Allowing the public to become involved in all aspects of grazing administration would greatly increase the amount of time the agencies would spend working with the public and permittees to facilitate consensus decisions. The decrease in stayed agency decisions would facilitate rapid implementing of forage adjustments, management revisions, and other</p>	<p>Without other livestock management responsibilities, BLM and the Forest Service could devote more resources to detecting and resolving unauthorized use. The two agencies would be required to pay grazing permittees for the current value of their private investments in projects they could no longer use.</p>

*continued...*





**Table 2-9 (continued):** Summary of Impacts

Environmental Factor	Current Management	Proposed Action	Livestock Production	Environmental Enhancement	No Grazing
<p><b>Grazing Administration</b> <i>(continued)</i></p>	<p>reduced administrative efficiencies. BLM grazing advisory boards strongly influence decisions on spending and setting priorities for Range Betterment Funds, and their recommendations tend to favor improvements that directly benefit livestock interests. The Forest Service does not have grazing advisory boards. Subleasing, while now recognized as illegal, has caused an administrative burden for BLM. The Forest Service requires holders of term grazing permits to own both permitted livestock and the associated base property. Current livestock grazing regulations would limit BLM to penalizing grazing permittees only for violating the Endangered Species and Bald Eagle Protection Acts. Forest Service regulations cover most environmental protection laws and state wildlife laws. Betterment Funds are currently distributed by BLM to their areas of origin. The Forest Service distributes half of the Range Betterment Funds are now distributed by BLM to their areas of origin. The Forest Service distributes half of Range Betterment Fund to the area of origin and gives the regional forester discretion to distribute the other half on the basis of regional priorities. Use of Range Betterment Funds is generally limited to design and building of improvements. In some areas, the Forest Service also uses these funds for planning and environmental analysis</p>	<p>grazing permits, disqualification, and implementing ecosystem rangeland management.</p> <p>Including livestock grazing, temporary nonuse, and conservation use as part of authorized use would trim the administrative workload since conservation use would be incorporated into the terms of BLM grazing permits. The implementation of appeal procedures would allow most BLM decisions to take effect within 75 days. Forest Service decisions related to grazing permit compliance would not be automatically stayed. Forest Service decisions made through the NEPA process would be stayed for 45 days if appealed. Resource advisory councils would provide more balanced input to BLM policy and decision processes. Local Forest Service units could participate on these councils as they determine necessary. and/or livestock leases as the surcharge would reduce profitability.</p> <p>The number of base property and livestock leases would decrease as the surcharge reduces profitability.</p>	<p>Service regulations would be more alike than at present, making it easier to consistently implement ecosystem management.</p> <p>The time and money spent by the agencies would be greatly reduced by transferring administrative roles to grazing associations formed by grazing advisory boards. These responsibilities would include resolving unauthorized use, enforcing permit compliance, and collecting grazing fees. This change in roles would change some agency positions from administrative and regulatory oversight to regulatory oversight.</p> <p>Ecosystem management would emphasize livestock production and local cultural and traditional values.</p>	<p>administrative changes resulting from standards and guidelines. Permittee performance as acceptable land stewards would play a major role in determining the length of their grazing permit. Resource advisory councils would provide more balanced input into both agencies' decisionmaking process and they enhance the implementing of ecosystem management. Removing livestock grazing from unsuitable areas would reduce the number of grazing permits processed. But this decline would be offset by the workload of handling the petition process.</p>	

*continued...*



**Table 2-9 (continued): Summary of Impacts**

Environmental Factor	Current Management	Proposed Action	Livestock Production	Environmental Enhancement	No Grazing
<b>Grazing Administration (continued)</b>	directly associated with building improvements. Both agencies are developing policies that promote ecosystem management.				
<b>Wild Horses and Burros</b>	Existing private control of water rights and range improvements on BLM administered herd management areas would hinder the meeting of wild horse and burro management objectives. The Forest Service currently controls livestock water rights and permanent range improvements on national forest lands. Livestock would continue to compete with wild horses and burros for water and forage. Improved upland vegetation trends would favor the forage base for wild horses and burros. The influence of BLM grazing advisory boards would focus on livestock production discouraging wild horse and burro considerations in local resource management. The Forest Service does not use grazing advisory boards.	BLM would file for water rights for new water developments for grazing related purposes on public land. The Forest Service currently files for all livestock water rights on National Forest land. Agency control of water rights would provide additional opportunity for management of available water for wild horses and burros, increasing dispersment and improving overall vegetation. BLM would own all new permanent range improvements on BLM land as the Forest Service currently does on National Forest land, which would focus range improvement more on development for mutual benefits including emphasis on wild horses and burros. Replacing BLM grazing advisory boards with BLM multiple resource advisory councils would have a more balanced focus towards wild horse and burro management. The Forest Service would continue to involve interested publics through the NEPA process.	Improvement in upland vegetation condition would increase the amount and quality of wild horse and burro forage. Focusing on increasing livestock production, increased range improvements would mainly consist of vegetation treatments and water developments. These improvements in wild horse and burro management areas would improve conditions for wild horse and burros. But increased livestock management fences in wild horse management areas would inhibit the free roaming of wild horses and burros.	Improvement of upland and riparian vegetation zones would provide improved conditions for wild horses and burros where competition with livestock has been eliminated because of nonfunctioning and functioning but subject to degradation determinations. Range improvements and water developments would be managed with a broader diversity of values, improving conditions and opportunities for more intensive wild horse and burro management. Multiple resource advisory councils would have more diverse interests, resulting in increased emphasis on wild horse and burro management.	Improved upland and riparian vegetation zones would improve range conditions of wild horses and burros where they compete with livestock. Range improvements blocking wild horse and burro movement would be removed. The loss of range improvements critical to wild horses and burros would harm these animals until budget and management processes were developed to provide these needs. Improvements would be built for wild horses and burros. Publicly owned water developments and fences would be built in herd management areas to protect riparian and other sensitive areas.
<b>Recreation and Scenic Values</b>	Alternatives that would most improve riparian and wildlife habitat conditions would generally result in the greatest improvement in opportunities for recreation, particularly fishing, camping, picnicking, hunting, birdwatching, and related activities.				

*continued...*





**Table 2-9 (continued): Summary of Impacts**

<b>Environmental Factor</b>	<b>Current Management</b>	<b>Proposed Action</b>	<b>Livestock Production</b>	<b>Environmental Enhancement</b>	<b>No Grazing</b>
<b>Wilderness</b>	Effects on wilderness values would generally correspond to projected effects on vegetation and watershed conditions and wildlife habitat. Alternatives that result in more naturally appearing and functioning ecosystems would result in landscapes that more closely meet the definition of wilderness. Wilderness-related recreation values would generally be affected in the same way as other recreation values.				
<b>Cultural and Paleontological Values</b>	Effects on cultural and paleontological values are generally related to grazing intensity and surface disturbance from building range improvements. Alternatives that would allow less livestock grazing of forage and fewer range improvements generally would cause less disturbance to cultural and paleontological resources.				
<b>Economic Conditions</b>	<u>EMPLOYMENT LOSSES WESTWIDE:</u>	<u>EMPLOYMENT LOSSES WESTWIDE:</u>	<u>EMPLOYMENT LOSSES WESTWIDE:</u>	<u>EMPLOYMENT LOSSES WESTWIDE:</u>	<u>EMPLOYMENT LOSSES WESTWIDE:</u>
<b>Employment and Income</b>	5 years: 710 - 1,820 jobs (0.1%)	5 years: 1,680 - 2,710 jobs (0.1% - 0.2%)	5 years: 470 - 1,610 jobs (up to 0.1%)	5 years: 7,240 - 7,820 jobs (0.5%)	18,300 jobs (1% of total agricultural employment; less than 0.1% of total westwide employment)
	20 years: 2,640 - 3,580 jobs (0.2%)	20 years: 2,760 - 3,680 jobs (0.2%)	20 years: 1,700 - 2,730 jobs (up to 0.2%)	20 years: 4,390 - 5,200 jobs (0.3%)	
	<u>TOTAL INCOME LOSSES WESTWIDE:</u>	<u>TOTAL INCOME LOSSES WESTWIDE:</u>	<u>TOTAL INCOME LOSSES WESTWIDE:</u>	<u>TOTAL INCOME LOSSES WESTWIDE:</u>	<u>TOTAL INCOME LOSSES WESTWIDE:</u>
	5 years: \$28.7 - \$69.9 million (0.1% - 0.2%)	5 years: \$69.9 - \$106.1 million (0.2% - 0.3%) (See Figure 2-9)	5 years: \$19.1 - \$61.1 million (up to 0.2%) (See Figure 2-9)	5 years: \$292.3 - \$314 million (1%) (See Figure 2-9)	\$737.1 million (2.4% of total agricultural employment; 0.5% of total westwide income)
	20 years: \$106.7 - \$141.5 million (0.3% - 0.4%)	20 years: \$111.5 - 145.7 million (0.3% - 0.4%) (See Figure 2-10)	20 years: \$68.5 - 106.7 million (up to 0.3%) (See Figure 2-10)	20 years: \$177.2 - \$207.1 million (0.6%) (See Figure 2-10)	
	<u>RANCH INCOME AND OPERATIONS:</u>	<u>RANCH INCOME AND OPERATIONS:</u>	<u>RANCH INCOME AND OPERATIONS:</u>	<u>RANCH INCOME AND OPERATIONS:</u>	<u>RANCH INCOME AND OPERATIONS:</u>
	<u>425-cow operation with 60% forage dependency:</u>	<u>425-cow operation with 60% forage dependency:</u>	<u>425-cow operation with 60% forage dependency:</u>	<u>425-cow operation with 60% forage dependency:</u>	<u>425-cow operation with 60% forage dependency:</u>
	5 years: 13-cow loss and net cash returns loss of \$1,100 (at current fee level) to \$14,300 (at average regional fee level)	5 years: 32-cow loss and net cash returns loss of \$2,700 (at current fee level) to \$14,900 (at average regional fee level)	5 years: 8-cow loss and net cash returns loss of \$700 (at current fee level) to \$14,100 (at average regional fee level)	5 years: 133-cow loss and net cash returns loss of \$11,400 (at current fee level) to \$18,300 (at average regional fee level)	265-cow loss and net cash returns loss of \$22,800
	20 years: 53-cow loss and net cash returns loss of \$4,600 (at current fee level) to \$15,600 (at average regional fee level)	20 years: 56-cow loss and net cash returns loss of \$4,800 (at current fee level) to \$15,700 (at average regional fee level)	20 years: 32-cow loss and net cash returns loss of \$2,700 (at current fee level) to \$14,900 (at average regional fee level)	20 years: 80-cow loss and net cash returns loss of \$6,800 (at current fee level) to \$16,500 (at average regional fee level)	
	<u>90-cow operation with 30% forage dependency:</u>	<u>90-cow operation with 30% forage dependency:</u>	<u>90-cow operation with 30% forage dependency:</u>	<u>90-cow operation with 30% forage dependency:</u>	<u>90-cow operation with 30% forage dependency:</u>
5 years: 0.5-cow loss and net cash returns loss of \$40 (at current fee level) to \$1,400 (at average regional fee level)	5 years: 1-cow loss and net cash returns loss of \$100 (at current fee level) to \$1,400 (at average regional fee level)	5 years: 0-cow loss and \$0 net cash returns loss (at current fee level) to \$1,400 (at average regional fee level)	5 years: 5-cow loss and net cash returns loss of \$400 (at current fee level) to \$1,200 (at average regional fee level)	28-cow loss and net cash returns loss of \$2,400	
20 years: 2-cow loss and net cash returns loss of \$170 (at current fee level) to \$1,300 (at average regional fee level)	20 years: 2-cow loss and net cash returns loss of \$200 (at current fee level) to \$1,300 (at average regional fee level)	20 years: 1-cow loss and net cash returns loss of \$100 (at current fee level) to \$1,400 (at average regional fee level)	20 years: 6-cow loss and net cash returns loss of \$500 (at current fee level) to \$1,500 (at average regional fee level)		

continued...



**Table 2-9 (continued): Summary of Impacts**

Environmental Factor	Current Management	Proposed Action	Livestock Production	Environmental Enhancement	No Grazing
<p><b>Economic Conditions</b> <i>(continued)</i></p> <p>Permit Values</p>	<p>Retaining the current PRIA fee formula would generally maintain permit values. But uncertainty over future fees may cause permit values to be discounted. The effect on permit values of raising the grazing fee would vary by state and permittee. The significance of the impact would depend on when the permit was acquired. For permittees just purchasing permits where the permit values were not discounted, the impact might be significant. For permittees who have owned their permits for years, the impact might not be significant. Because they have benefitted from lower fees through the years and have thus already captured much of the permit value.</p> <p>The value lost from reductions in federal in federal forage would vary considerably depending on such factors as: how critical federal grazing is to the economic viability of the ranch, alternative sources of forage, season of use, the percentage of grazing eliminated, and location of the allotment.</p>	<p>The impact on permit value due to the grazing fee would be the same as Current Management. The overall impact on permit value from federal AUM reductions would be greater than Current Management, but would vary considerably from permittee to permittee. Some permittees would have no reductions in permit value while others would lose considerable permit value, at least in the short run.</p>	<p>The impact on permit value due to the grazing fee would be the same as Current Management. The overall impact on permit value from federal AUM reductions would be less than Proposed Action, but would vary considerably from permittee to permittee.</p>	<p>The impact on permit value due to the grazing fee would be the same as Current Management. The overall impact on permit value from federal AUM reductions would be much greater than under the Proposed Action. The impact on the permit value of individual permittees would vary considerably with some permittee's permit values being entirely eliminated.</p>	<p>Permit value would be eliminated.</p>

*continued...*





Table 2-9 (continued): Summary of Impacts

Environmental Factor	Current Management	Proposed Action	Livestock Production	Environmental Enhancement	No Grazing
<p><b>Economic Conditions</b> (continued)</p> <p>Grazing Fee Receipts and Payments</p>	<p><u>GRAZING FEE RECEIPTS:</u></p> <p><u>Under current PRIA level:</u></p> <p>5 years: -\$1.5 million (-5%)</p> <p>20 years: -\$6.2 million (-20%)</p> <p><u>Under other fee levels:</u></p> <p>5 years: \$6.3 million (21%) to \$69.5 million (226%)</p> <p>20 years: \$468,000 (2%) to \$53.7 million (174%)</p> <p><u>PILT:</u></p> <p>Counties that receive payments in lieu of taxes (PILT) under PILT "Formula A" may experience a decrease in PILT payments if county grazing fee receipts increase. But <u>total</u> receipts paid to these counties (the sum of grazing fee receipts and PILT payments) would remain unchanged. Counties that receive PILT payments under PILT "Formula B" would experience no change in PILT payments regardless of changes in grazing fee receipts.</p>	<p><u>GRAZING FEE RECEIPTS:</u></p> <p><u>Under current PRIA level:</u></p> <p>5 years: -\$3.7 million (-12%)</p> <p>20 years: -\$6.5 million (-21%)</p> <p><u>Under other fee levels:</u></p> <p>5 years: \$3.6 million (12%) to \$62.1 million (202%)</p> <p>20 years: \$77,000 (0.2%) to \$52.6 million (171%)</p> <p><u>PILT:</u></p> <p>Same as under Current Management</p>	<p><u>GRAZING FEE RECEIPTS:</u></p> <p><u>Under current PRIA level:</u></p> <p>5 years: -\$923,000 (-3%)</p> <p>20 years: -\$3.7 million (-12%)</p> <p><u>Under other fee levels:</u></p> <p>5 years: \$7.1 million (23%) to \$71.6 million (233%)</p> <p>20 years: \$3.6 million (12%) to \$62.1 million (202%)</p> <p><u>PILT:</u></p> <p>Same as under Current Management</p>	<p><u>GRAZING FEE RECEIPTS:</u></p> <p><u>Under current PRIA level and federal forage fee level:</u></p> <p>5 years: -\$11.2 million (-37%) to -\$15.4 million (-50%)</p> <p>20 years: -\$3.4 million (-11%) to -\$9.2 million (-30%)</p> <p><u>Under other fee levels:</u></p> <p>5 years: \$0 to \$22 million (71%)</p> <p>20 years: \$18.8 million (61%) to 43.1 million (140%)</p> <p><u>Under the modified PRIA fee level:</u></p> <p>Receipts would decline slightly over the short term (5 years) by \$246,000, and increase in the long term (20 years) by \$12 million (39%).</p> <p><u>PILT:</u></p> <p>Same as under Current Management</p>	<p><u>GRAZING FEE RECEIPTS:</u></p> <p>Grazing fee receipts would be eliminated. Estimated reduction is \$30.8 million.</p> <p><u>PILT:</u></p> <p>Counties that receive PILT payments under PILT "Formula A" would receive higher PILT payments because grazing fee receipts that are normally deducted from PILT payments under this formula would be eliminated. Counties that receive PILT payments under PILT "Formula B" would experience no change in PILT payments regardless of the elimination of grazing fee receipts.</p>

continued...



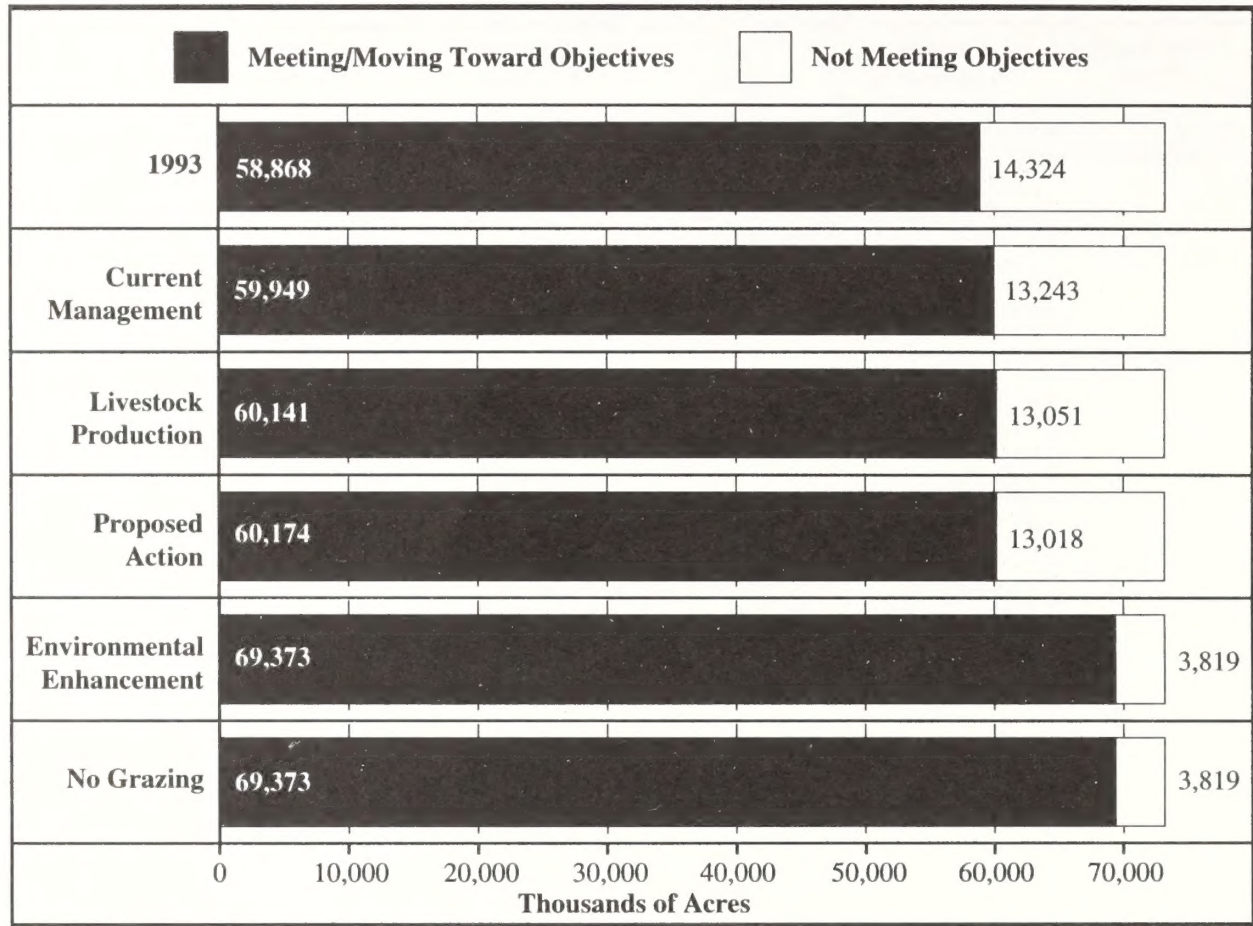
**Table 2-9 (concluded): Summary of Impacts**

Environmental Factor	Current Management	Proposed Action	Livestock Production	Environmental Enhancement	No Grazing
<p><b>Social Conditions</b></p>	<p>Impacts to ranchers would range from slight under the current fee formula to losses in income and possible declines in social well-being under higher fee formulas. Permittees would favor this alternative at the current fee level.</p> <p>Social impacts in most counties and communities would be slight. In counties and communities that depend more on tourism and recreation, differences in opinions and values among groups could reduce community cohesiveness.</p>	<p>Impacts to ranchers due to income losses and changes in ranch operations would be greater than under the Current Management and could result in higher levels of stress and increased stress-related problems.</p> <p>Social impacts in ranching-dependent communities would be greater than under the Current Management. Social impacts in counties and communities less dependent on ranching would be similar to those under Current Management.</p> <p>This alternative is consistent with the attitudes of increasing numbers of people in the West and across the country who believe that rangeland management should emphasize protection of rangeland resources rather than livestock management.</p>	<p>Harm to permittee social well-being would be less than under the Proposed Action. Permittees would have more control over their operations and would favor this alternative at the current fee level.</p> <p>Social impacts in ranching- dependent counties and communities would be slight. In counties and communities that depend more on tourism and recreation, differences in opinions and values among groups could cause reduced community cohesiveness.</p> <p>This alternative is inconsistent with the attitudes of increasing numbers of people in the West and across the country who believe that rangeland management should emphasize protection of rangeland resources rather than livestock management.</p>	<p>Social impacts to ranchers due to income losses and changes in ranch operations would be much greater than under the Proposed Action and could include some permittee outmigration. Negative permittee attitudes toward the Federal Government would increase. Some permittees might limit access opportunities to the public. Permittees would not favor this alternative at any fee level.</p> <p>Negative impacts to ranching- dependent communities could include reduced leadership and decreased revenues for local infrastructure and services. In counties and communities that are undergoing rural development and increases in tourism and recreation, differences in opinions and values among groups could cause reduced community cohesiveness.</p> <p>This alternative is consistent with the attitudes of increasing numbers of people in the West and across the country, who believe that rangeland management should emphasize protection of rangeland resources rather than livestock management.</p>	<p>Social impacts to ranchers due to income losses and changes in ranch operations would be greater than under the Environmental Enhancement alternative. Permittee reactions to this alternative would be extremely negative.</p> <p>Impacts to counties and communities would be similar to but more severe than under the <b>Environmental Enhancement</b> alternative.</p> <p>Most people in the West and across the country might feel that this alternative is too restrictive in removing all livestock from federal lands.</p>



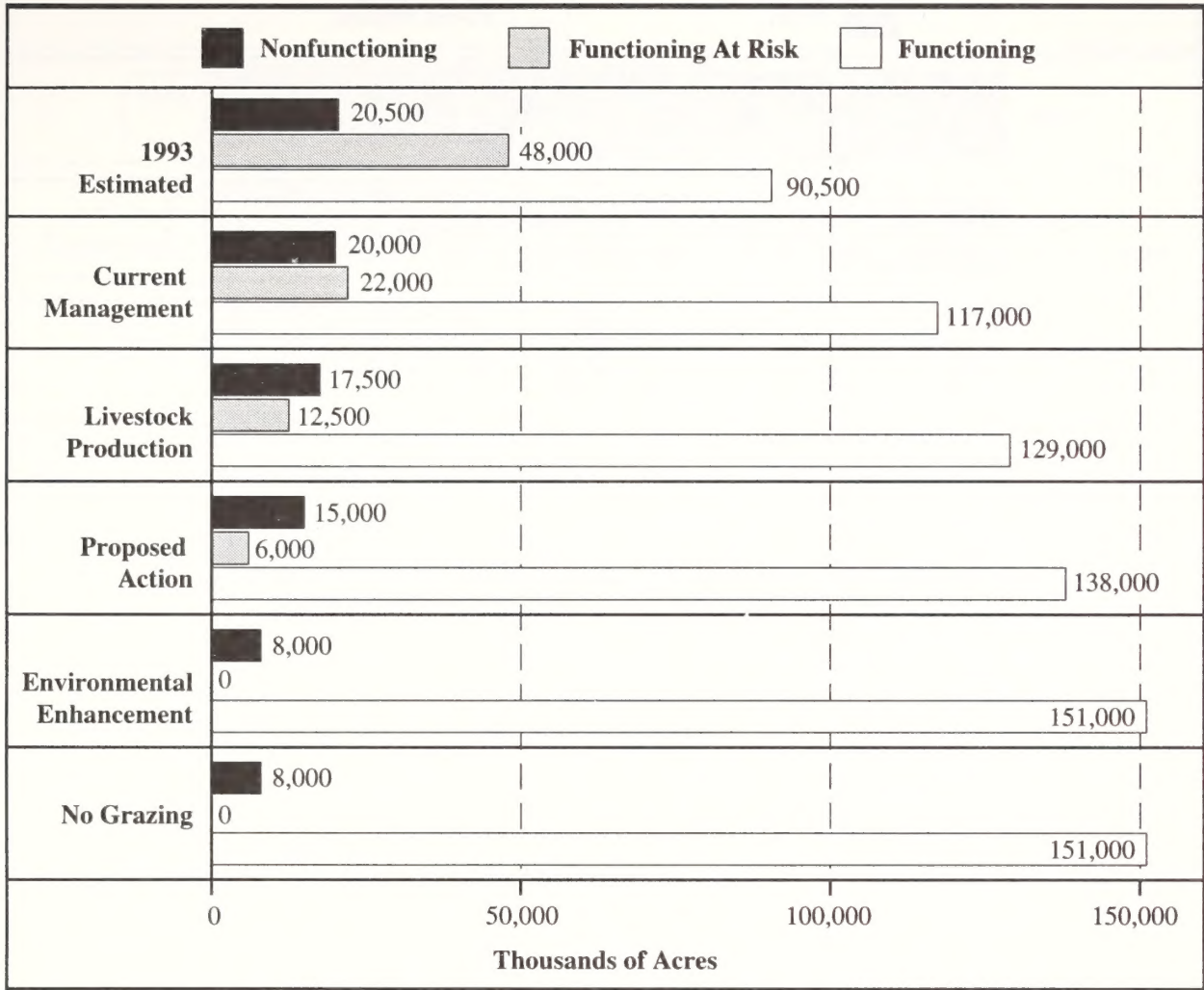


Figure 2-3: Change in Status - Forest Service Uplands - Comparison of Alternatives - Long Term (20 years)





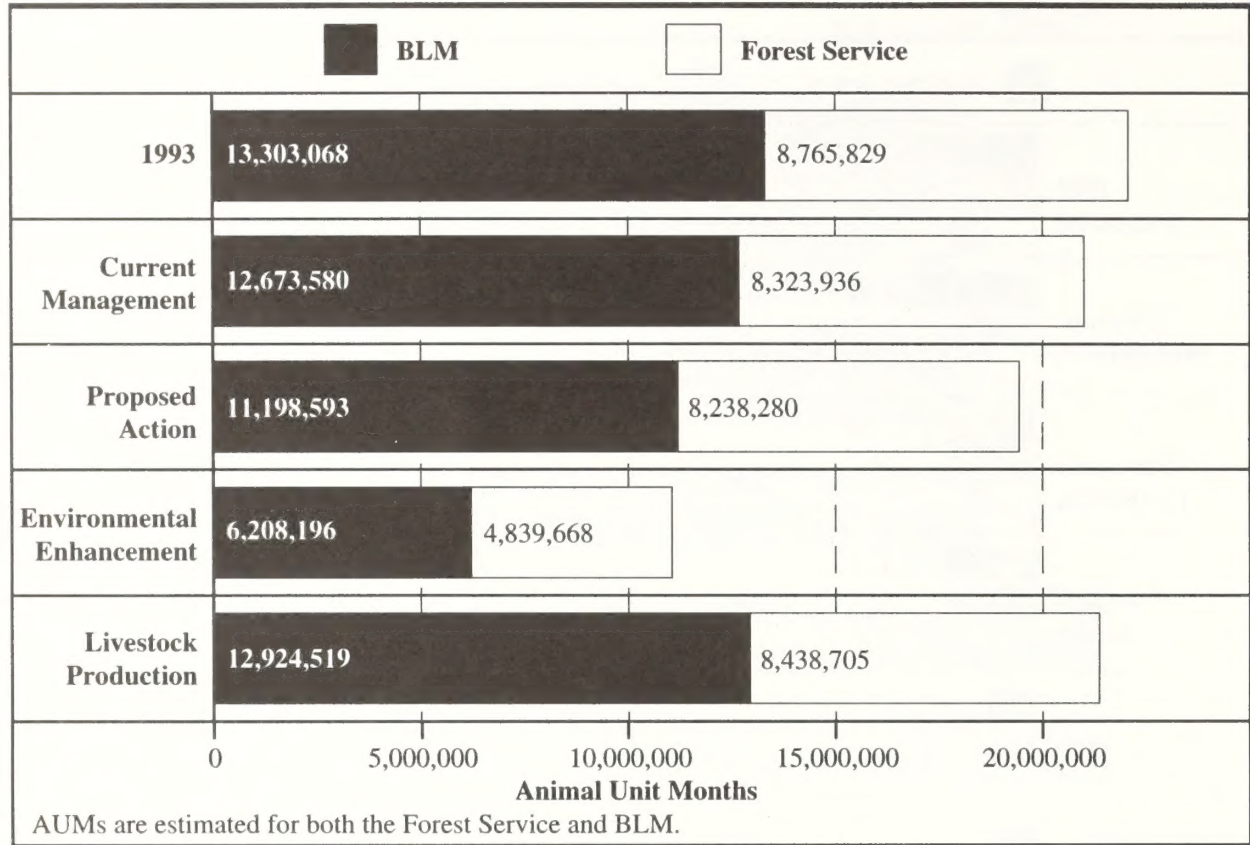
**Figure 2-4: Changes in Functioning Condition - BLM Uplands - Comparison of Alternatives - Long Term (20 years)**





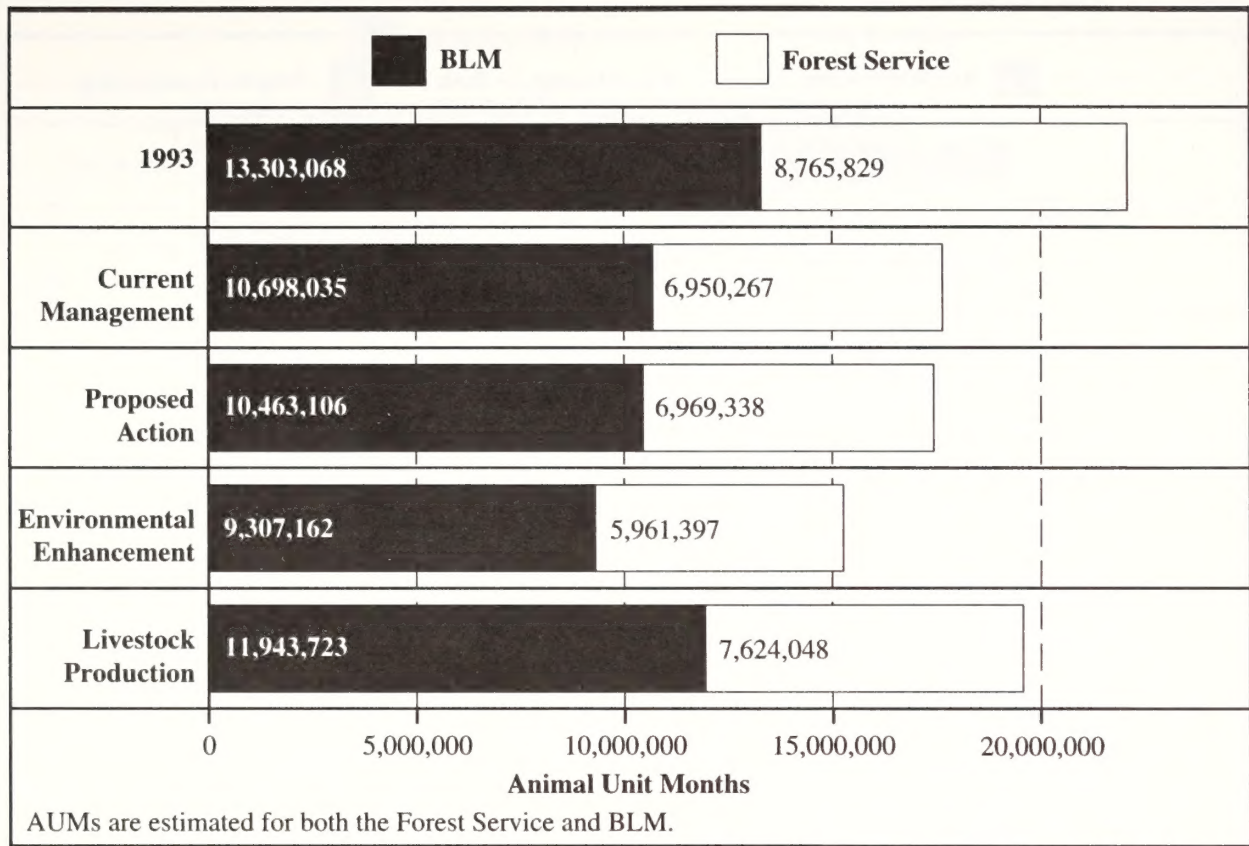


**Figure 2-5: Available Livestock Forage in Animal Unit Months - Alternative Comparison - Short Term**





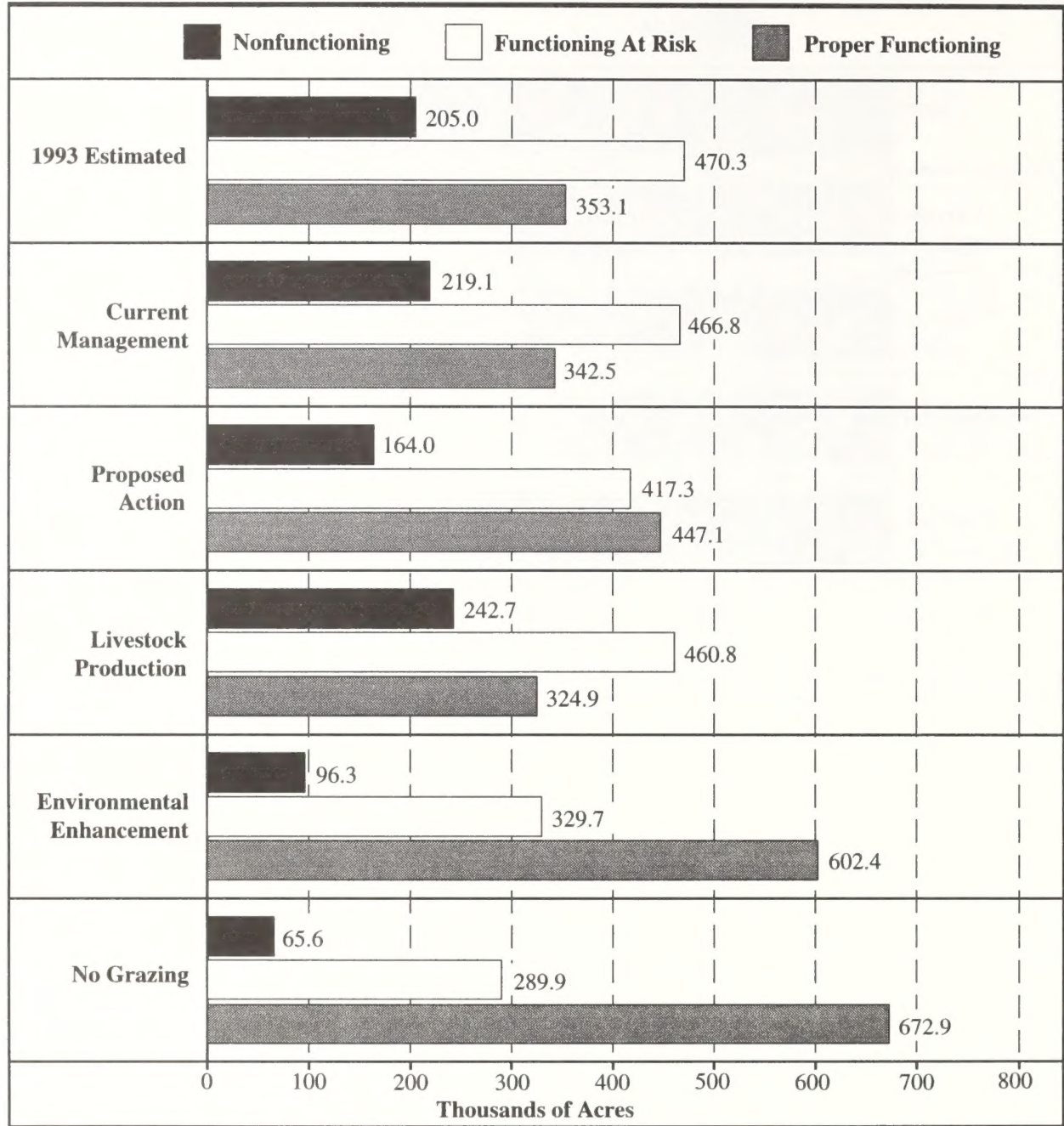
**Figure 2-6: Available Livestock Forage in Animal Unit Months - Alternative Comparison - Long Term**







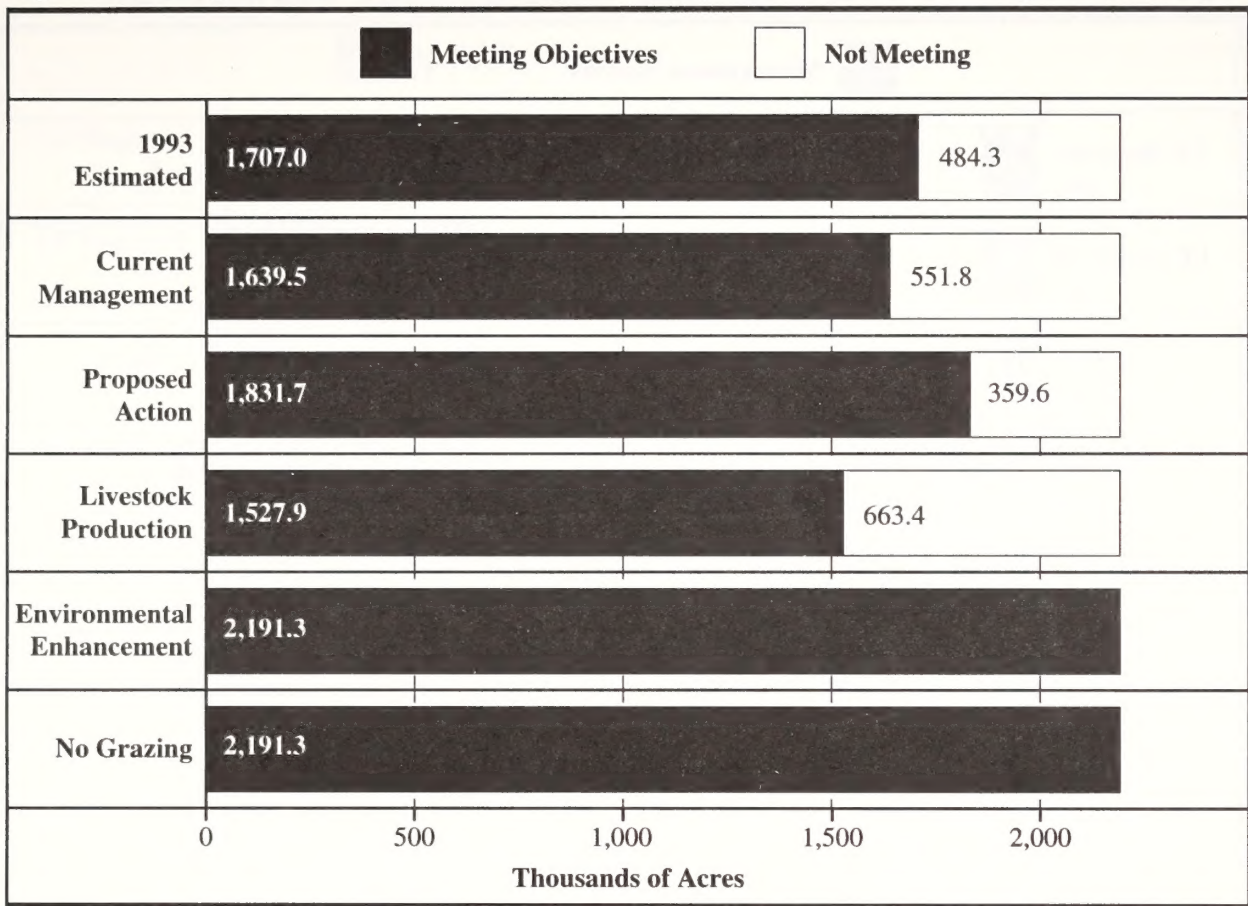
**Figure 2-7: Changes in Functioning Condition - BLM Riparian - Comparison of Alternatives - Long Term (20 years)**



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**Figure 2-8: Change in Status - Forest Service Riparian - Comparison of Alternatives - Long Term (20 years)**







**Figure 2-9: Reductions in Livestock Industry Income - Comparison of Impacts - Short Term (5 years)**

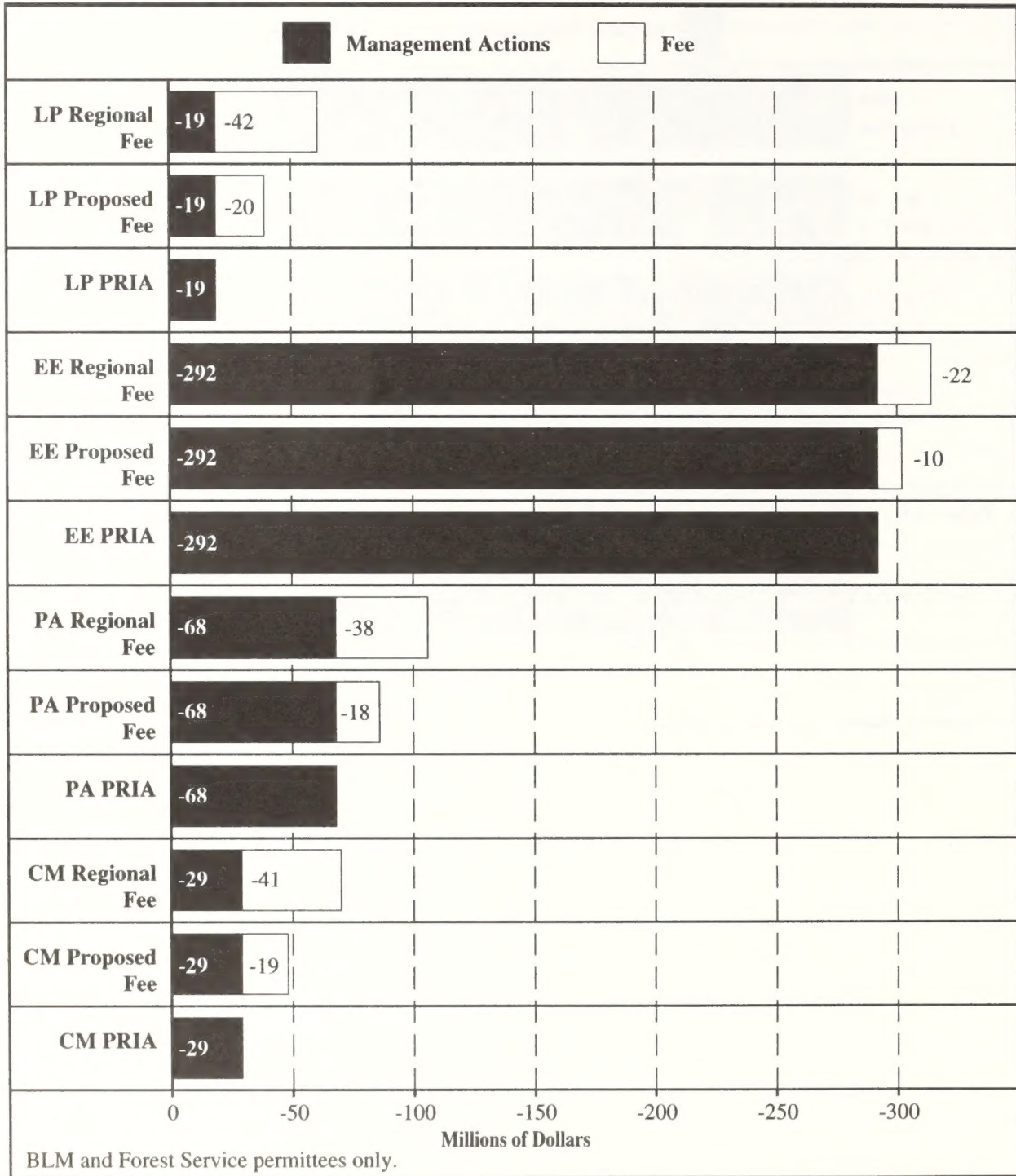
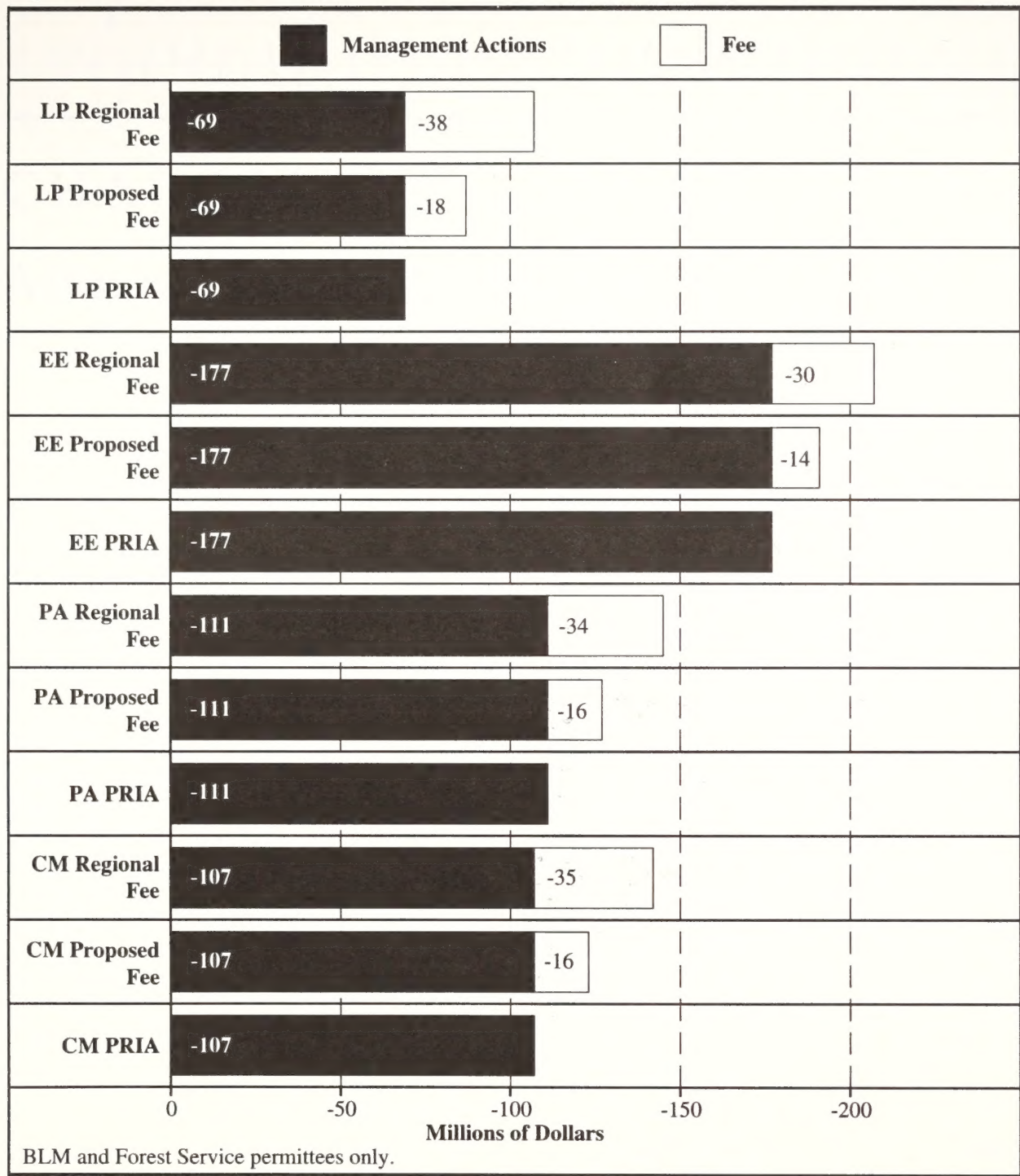


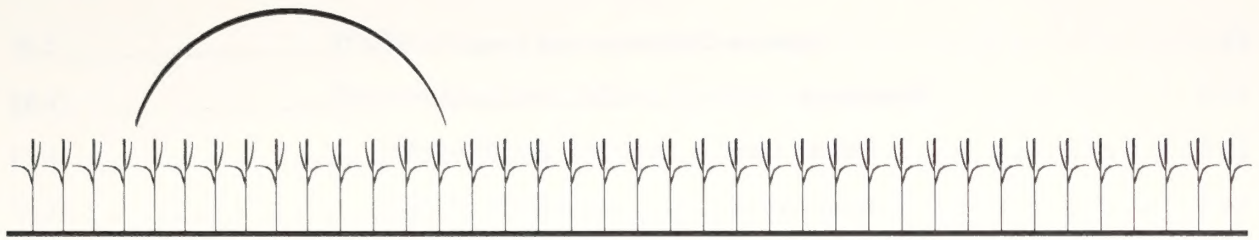


Figure 2-10: Reductions in Livestock Industry Income - Comparison of Impacts - Long Term (20 years)









# CHAPTER 3

## Affected Environment

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## General Setting

Chapter 3 describes the physical, biological, social, and economic environment of the West that would be affected by implementing the Proposed Action or any other alternative. Prime and unique farmlands, hazardous and solid wastes, and areas of critical environmental concern (ACECs) would not be affected by the Proposed Action or alternatives and are not discussed. Many resources protected by ACECs, however, would be affected and are described in this chapter.

Most federal lands grazed by livestock are in the 17 contiguous western states. (See Table

3-1.) The 17 states have a combined total of 1.16 billion acres of land, of which about 177 million acres are administered by BLM and 145 million acres are administered by the Forest Service. Roughly 28 percent of all the land in the western states is federal land, although percentages vary from 0.2 percent federal land in Kansas to almost 77 percent federal land in Nevada. A foldup map enclosed in this EIS shows the ownership and location of federal land in the 17 western states. The proposed changes to management regulations specific to the Forest Service apply to National Forest System lands in the Eastern States, as well as to lands in the 17 western states.

**Table 3-1: Federal Land in 17 Western States (Surface Acres)**

	Total Acres	BLM Acres	FS Acres
Arizona	72,688,000	14,257,623	11,246,668
California	100,206,720	17,240,275	20,615,963
Colorado	66,485,760	8,309,528	14,466,612
Idaho	52,933,120	11,859,423	20,440,564
Kansas	52,510,720	42	108,175
Montana	93,271,040	8,066,927	16,806,126
Nebraska	49,031,680	7,613	351,926
Nevada	70,264,320	47,998,825	5,801,183
New Mexico	77,766,400	12,878,826	9,321,181
North Dakota	44,452,480	66,484	1,105,786
Oklahoma	44,087,680	2,630	300,543 <sup>a</sup>
Oregon	61,598,720	15,714,236	15,655,087
South Dakota	48,881,920	279,150	2,012,974
Texas	168,217,600	0	754,640 <sup>b</sup>
Utah	52,696,960	21,937,273	8,098,644
Washington	42,693,760	327,284	9,160,076
Wyoming	62,343,040	18,399,710	9,245,737
<b>Totals</b>	<b>1,160,129,920</b>	<b>177,345,849</b>	<b>145,491,885 <sup>c</sup></b>

<sup>a</sup> Includes 254,257 acres (Ouachita National Forest) that would not be subject to proposed fee changes.

<sup>b</sup> Includes 637,109 acres (Angelina, Davy Crockett, Sabine, and Sam Houston National Forests) that would not be subject to proposed fee changes.

<sup>c</sup> A total of 144,600,519 acres would be subject to proposed fee changes.

Source: BLM 1992a; Forest Service 1993c



## Analysis Areas

Public rangelands in the 17 western states have a wide range of climates, landforms, vegetation types, and social and economic settings. Physical characteristics, such as climate and soil types, and biological parameters, such as vegetation productivity and the presence of special status species, differ markedly. Because physical and biological attributes differ in each area, the alternatives will likely affect each area differently.

Six regions were selected for the analysis, as shown on Map 3-1. The boundaries divide the areas by their dominant vegetation and watershed characteristics. Cultural and economic characteristics were also considered. Some boundaries were adjusted to match BLM and Forest Service administrative boundaries and ease data analysis. Vegetation and watershed characteristics help classify broad areas of the West by the type of soils and climate and past land use practices. These characteristics also show the effects of changing rangeland management practices.

The analysis areas are as follows: (1) Coastal, (2) Colorado Plateau, (3) Columbia Basin, (4) Great Basin, (5) Rocky Mountains and

High Plains, and (6) Southwest. Riparian areas are addressed separately within this analysis. The six analysis areas cover roughly 244 million acres of federal land grazed by livestock (See Table 3-2.)

In western Washington, Oregon, and California, the Coastal analysis area has a Mediterranean climate and vegetation in the south and temperate rain forests in the north. Perhaps the most biologically diverse of the analysis areas, this region also has forest industries and extensive urban and agricultural areas.

Including a diverse array of landforms and climates, the Colorado Plateau analysis area encompasses the middle and upper portions of the Colorado River drainage basin and a portion of the upper Rio Grande basin. This region's southern and western portions consists of canyon country with dissected sandstone plateaus. Its northern portion consists largely of high-elevation plains. The remainder of the region is dominated by high mountains and alpine plateaus.

The Columbia Basin analysis area generally encompasses the Columbia River drainage east of the Cascade Mountains. Most of the analysis area is dominated by rugged, forested mountains, heavy winter snow accumulations, and fast-flowing rivers supporting valuable anadromous fisheries. The remainder of the area gen-

**Table 3-2: Land Managed by BLM and Forest Service by Analysis Area**

Analysis Area	Total Acres (thousands)			Acres within Grazing Allotments (thousands)		
	BLM	Forest Service	Combined	BLM	Forest Service	Combined
Coastal	4,563	25,742	30,305	1,519	8,257	9,776
Colorado Plateau	31,101	28,253	59,354	28,749	24,944	53,693
Columbia Basin	18,381	42,614	60,995	19,026 <sup>a</sup>	12,908	31,934
Great Basin	58,719	19,077	77,796	55,733	15,450	71,183
Rocky Mountains/ High Plains	21,285	18,987	40,272	20,794	13,822	34,616
Southwest	43,297	9,710	53,007	33,073	9,507	42,580
<b>Totals</b>	<b>177,346</b>	<b>144,383</b>	<b>321,729</b>	<b>158,894</b>	<b>84,888</b>	<b>243,782</b>

<sup>a</sup> Includes land withdrawn by the Bureau of Reclamation, on which livestock grazing is administered by BLM



# Map 3-1. Analysis Areas





erally has gently rolling or hilly, arid landscapes dominated by volcanic flows and sagebrush. The southern and central portions of the Columbia Basin tend to be in poorer condition. There exotic annual grasses have become firmly established. Lowlands in the north support more native perennial grasses and have a higher potential to respond to changes in grazing management.

The Great Basin analysis area encompasses the cold deserts of Nevada, western Utah, southeast Oregon, and extreme eastern California. The analysis area has inland basins bisected by north-south trending mountain ranges. Vegetation and soil productivity vary from low near the playa lakebeds in most valley bottoms to high along streams and in mountainous areas. Vegetation types generally consist of salt-tolerant shrubs interspersed with bunchgrasses. The drier valleys, especially in the higher elevations, respond to changes in grazing management slower than wetter areas.

The Rocky Mountains and High Plains analysis area generally encompasses the western Great Plains, isolated mountain islands, and the eastern slopes of the Rocky Mountains in Montana, Wyoming, Colorado, and northeast New Mexico. The Rocky Mountains have high soil productivity, a predominance of grasses in rangeland vegetation types, and a relatively high response to changes in grazing management.

The Desert Southwest analysis area includes the Mojave, Chihuahuan, and Sonoran Deserts of southern California, Arizona, Nevada, New Mexico, and Utah. The area has a long frost-free growing season and an arid climate. It includes a mosaic of vegetation but is dominated by shrubsteppe and desert shrub communities. The area also includes many desert and alpine mountain ranges that support a variety of pinon-juniper woodlands and conifer forests.

## *Climate*

Climate is a major determinant of the distribution and growth of rangeland vegetation and the formation and erosion of rangeland soils. The study area consists of five major climatic types (Trewartha and Horn 1980). The coastal Pacific Northwest, from northern California to Canada, has a temperate oceanic climate. The coastal Pacific Southwest has a subtropical dry

summer—Mediterranean—climate. The deserts of southern Nevada, southwest Utah, northwest, western, and southern Arizona, and southern New Mexico have a subtropical, hot desert climate. The Cascade and Rocky Mountains have variable highland climatic conditions. And the remainder of the study region (where most nondesert BLM-administered lands are located) has a continental, cold steppe climate.

Temperatures vary mostly with latitude, elevation, moisture, and to a lesser extent, microclimate. At higher elevations, freezing temperatures are possible throughout the year.

Annual precipitation greatly varies, mainly because of local topography and the variability of storm tracks. Precipitation comes from spring, summer, and fall thunderstorms—except in the coastal Pacific Northwest, Pacific Southwest, and areas with high snowpack. The West gets snow at high latitudes and elevations throughout the year. The highest elevations receive the most snow.

The temperate oceanic climate is dominated by moist, onshore winds. Precipitation is reliable and abundant. Growing seasons are unusually long at high latitudes. Areas that have a temperate oceanic climate are cooler in the summer than other areas at similar latitudes.

The subtropical dry summer (Mediterranean) climate type is well known for its abundant sunshine and dry summers, with wet and mild winters. Freezing conditions are rare, making growing seasons long.

The subtropical, hot desert climate is continental and dry with slight but highly variable precipitation. As a result, deserts have sunny days, clear nights, high evaporation, and large daily and seasonal temperature changes.

Complex mountainous topography causes much variation in site-specific temperature and precipitation of highland climates.

The continental, cold steppe climate type is typified by low to moderate precipitation, which usually falls in summer. Temperatures vary from cold winters to hot summers, and spring typically arrives suddenly and warms quickly.

The following analysis area descriptions are generalizations of their complex climatic conditions. Site-specific monitoring is needed to determine local climatic conditions. Table 3-3 presents climatic data for a variety of western cities and towns.



**Table 3-3: Climate Data**

Station	Analysis Area	Elevation (Ft. Mean) Sea Level	Annual Mean Temp (°F)	Annual Mean Precip. (")	Frost Free Days
Lakeview, OR	Great Basin	4,780	46	15	101
Austin, NV	Great Basin	6,600	48	13	110
McGill, NV	Great Basin	6,300	47	9	118
Winnemucca, NV	Great Basin	4,300	49	8	104
Deseret, UT	Great Basin	4,590	49	7	117
Spokane, WA	Columbia Basin	2,360	48	16	163
Pendleton, OR	Columbia Basin	1,480	63	12	188
Caldwell, ID	Columbia Basin	2,370	51	11	144
Aberdeen, ID	Columbia Basin	4,410	45	9	100
Challis, ID	Columbia Basin	5,180	44	7	113
Alton, UT	Colorado Plateau	7,040	45	16	110
Blanding, UT	Colorado Plateau	6,040	50	13	149
Holbrook, AZ	Colorado Plateau	5,070	55	9	159
Grand Jct., CO	Colorado Plateau	4,840	53	9	182
Vernal, UT	Colorado Plateau	5,260	45	8	119
Moccasin, MT	Rockies/High Plains	4,300	43	15	110
Gillette, WY	Rockies/High Plains	4,640	45	15	125
Cheyenne, WY	Rockies/High Plains	6,120	45	15	133
Ekalaka, MT	Rockies/High Plains	3,430	44	15	115
Rocky Ford, CO	Rockies/High Plains	4,170	53	12	157
Ft. Baynard, NM	Desert Southwest	6,140	55	16	125
Tombstone, AZ	Desert Southwest	4,610	63	14	233
Artesia, NM	Desert Southwest	3,320	60	12	198
Caliente, NV	Desert Southwest	4,400	53	9	152
Parker, AZ	Desert Southwest	410	71	5	285
Salem, OR	Coastal	200	52	40	190
Ukiah, CA	Coastal	630	59	36	215
Olga, WA	Coastal	80	50	29	237
Paseo Robles, CA	Coastal	700	59	14	194
Redlands, CA	Coastal	1,320	64	13	306

**Source:** U.S. Department of Commerce, National Climatic Data Center



The Great Basin analysis area has a subtropical, hot desert climate type throughout central Nevada, and a continental, cold steppe climate type in the remaining area. Scattered mountainous areas exhibit variable highland climatic conditions.

In the desert, average annual precipitation ranges from 6 to 10 inches, resulting mostly from winter storms and some summer thunderstorms. Frost-free periods normally last 3 to 4 months.

In other portions of the Great Basin, the average annual precipitation ranges from 8 to 16 inches. Most precipitation falls between spring and fall. Frost-free periods normally last for 9 to 11 months.

The Columbia Basin analysis area has mainly a continental, cold steppe climate type surrounded by the variable highland climatic areas of the Cascade Mountains to the west and the northern Rocky Mountains to the north and east. In the lowlands, average annual precipitation varies from 8 to 16 inches. Most of the precipitation falls between spring and fall. Frost-free periods normally last 9 to 11 months.

The Colorado Plateau analysis area is bordered on the east by the central and southern Rocky Mountains, on the north by the Wind River and Teton ranges, and on the west by the Uinta Mountains and the Wasatch Front. Most of the rest of the analysis area has a continental, cold steppe climate type, with a small area of subtropical, hot desert in southcentral Utah.

Climatic conditions are highly variable. The average annual precipitation ranges from 12 to 20 inches. Most precipitation falls in the summer as thunderstorms. Frost-free periods normally last 3 to 7 months.

The Rocky Mountains and High Plains analysis area has mainly a continental, cold steppe climate, bordered on the west by the variable highland climate of the northern, central, and southern Rocky Mountains. Precipitation amounts are fairly uniform. In the Rockies and High Plains annual precipitation averages 14 to 20 inches. Most precipitation falls from spring to fall during thunderstorms. Frost-free periods normally last from 3 to 9 months.

The Desert Southwest analysis area has a mostly subtropical, hot desert climate type with a continental, cold steppe, and variable highland climate from the Grand Canyon region along the White Mountains into western New Mexico.

In the Desert Southwest, the annual precipitation averages less than 10 inches, falling primarily during summer thunderstorms. Frost-free periods normally last from 8 to 10 months.

The Coastal analysis area has a temperate oceanic climate in the north, and a subtropical dry summer (Mediterranean) climate in the south. The analysis area is bordered on the east by the Cascade Mountains and the Sierra Nevada. Annual precipitation varies from 12 inches in the chaparral and mountain shrub areas in the south to 100 inches in the Pacific Northwest. Frost-free periods range from 4 to more than 11 months.

## *Air Quality*

The air quality above most western federal lands cannot be easily described, since monitoring data has not been gathered for most pollutants outside urban areas. In less developed portions of the West, however, ambient pollutant levels are expected to be near or below the measurable limits.

Air quality regulations consist of the National Ambient Air Quality Standards (NAAQS) and the Prevention of Significant Deterioration (PSD) increments. The NAAQS limit the amount of specific pollutants allowed in the atmosphere.

PSD Class I areas, predominately national parks and certain wilderness areas, have the greatest limitations. Virtually any degradation would be significant. Areas where moderate, controlled growth can take place are designated PSD Class II. PSD Class III areas allow the greatest degree of impacts.

A total of 114 Class I areas have been designated in the EIS area, consisting predominantly of lands administered by the National Park Service, U.S. Fish and Wildlife Service, and the Forest Service. Most Class I areas are in mountainous regions, but some are at lower elevations. All BLM-administered lands are classified PSD Class II.

## *Grazing Administration*

BLM administers livestock grazing on federal land under the authority of Sections 3 and 15 of the Taylor Grazing Act. The Forest Service administers grazing on federal land under authority of the Organic Administration Act,



Granger-Thye Act, Forest and Rangeland Renewable Resources Planning Act, and National Forest Management Act. Other laws governing livestock grazing on federal land include the Bankhead-Jones Farm Tenant Act, National Environmental Policy Act (NEPA), Federal Land Policy and Management Act, and Public Rangelands Improvement Act.

The administration of livestock grazing involves issuing permits and annual grazing licenses, verifying that livestock permittees are complying with the terms of their permits and federal regulations, preparing land use and activity plans, and conducting rangeland monitoring studies.

The costs of managing public rangeland are shown in Table 3-4. The nongrazing expenses are for activities that preserve rangeland, including collecting data for monitoring rangeland condition and preventing unauthorized uses of federal rangeland. All other expenses in the rangeland program are for managing livestock grazing: administering permits, designing grazing systems, complying with the National Environmental Policy Act, preparing and implementing plans, making improvements on grazed rangelands, and working with permittees. BLM and the Forest Service spend an average of \$3.99 per animal unit month (AUM) of forage grazed by livestock on lands they administer. In 1993, the grazing fee was \$1.86/AUM.

The Forest Service has completed forest plans and EISs. The plans specify standards and guidelines for livestock grazing on national forests and grasslands. BLM has prepared resource management plans and EISs. The age of BLM's land use plans on grazing management vary.

Plans completed 7 or more years ago are usually outdated because they do not address more recent policies on riparian management. Allotment management plans (AMPs) incorporate current policy as well as land use plan guidance.

BLM authorizes more than 15 million AUMs of forage for the lands it administers; 2.1 million of those AUMs are in suspended nonuse. Suspended nonuse refers to forage that at one time livestock could graze but was later suspended from grazing because an evaluation found that the rangeland could not support that high a level of grazing. Though "suspended" forage cannot be used, it remains as part of the total number of AUMs on a permit. About 8.8 million AUMs are actively used on national forests and grasslands. The Forest Service does not allow suspended nonuse.

Over each of the last 3 years, an average of 82 percent of BLM-managed forage that was designated for the livestock industry's use was paid for and consumed. In 1992, 83 percent of Forest Service-managed forage that was designated for the livestock industry's use was paid for and consumed.

Permittees can apply for annual nonuse status of their AUMs for personal reasons or to conserve federal rangelands. Personal reasons might include financial hardships that full use would require and the logistical problems of moving livestock from private pastures to federal rangeland. Resource conservation use is usually authorized to improve resources and meet resource condition objectives.

From 1990 to 1992, an average of 18 percent of BLM active preference was put into nonuse. In 1992, 17 percent of the Forest Service permit-

**Table 3-4: BLM and Forest Service Rangeland Management Program Costs for 1993**

BLM and Forest Service - Administered Lands	Rangeland Program Costs		Livestock Grazing Expenses		Nongrazing Expenses <sup>1</sup>
	Total (\$1,000)	Cost/AUM (\$)	Total (\$1,000)	Cost/AUM (\$)	Total (\$1,000)
Rangeland Management	77,045	4.72	52,683	3.23	24,362
Rangeland Improvements	16,991	1.04	12,456	0.76	4,535
<b>Totals</b>	<b>94,036</b>	<b>5.76</b>	<b>65,139</b>	<b>3.99</b>	<b>28,897</b>

<sup>1</sup> The nongrazing expense is the proportion of the 1993 appropriation attributable to a rangeland ecology program rather than the amount needed to meet rangeland ecology objectives.



In 1992, 17 percent of the Forest Service permitted use was approved as nonuse. Of the total nonuse taken, about 63 percent of BLM nonuse and 57 percent of the Forest Service nonuse was approved for personal reasons.

Permits have been issued to about 27,000 livestock operators who use BLM or Forest Service-administered land. BLM's permits either have terms of 10 years (55 percent of all BLM permits), 5 to 10 years (13 percent), or less than 5 years (32 percent). Almost all Forest Service term permits are issued for 10 years.

Forage authorized for livestock grazing ranges from less than 100 AUMs to more than 5,000 AUMs. Nationwide, about 42 percent of BLM permits and 30 percent of Forest Service permits are issued for less than 100 AUMs. (See Table 3-5.)

In 1992, BLM-administered land had 1,520 base property leases and 756 livestock pasturing agreements. Forest Service regulations require permittees to own their base property and livestock.

In 1992, roughly 100 BLM grazing decisions were appealed. Depending on the backlog of appeals, the timeframe for a grazing decision to be implemented can range from 3 months to 4 years.

## Range Betterment Funds

Receipts from grazing fees are distributed, according to legislative requirements, to the agencies' Range Betterment Funds, states, and the U.S. Treasury. During fiscal year 1993, the BLM Range Betterment Funds totalled \$8.7 million. In 1991, the Forest Service's Range Betterment Funds totalled \$5.4 million.

**Table 3-5: Number of Permits and Leases by AUM Authorizations**

Agency	Number of Permits		
	<100 AUMs	101-500 AUMs	>500 AUMs
BLM	8,022	5,904	5,041
Forest Service	2,335	2,695	2,787
<b>Totals</b>	<b>10,357</b>	<b>8,599</b>	<b>7,828</b>

## Vegetation

Vegetation can be described in many ways. For example, plant communities are often at first described by the kind and abundance of organisms within them. Since communities are often modified by humans and plants and animals compete for survival, communities constantly experience plant succession and fluctuating population and productivity levels. As new information is gathered, communities may be described by their responsiveness and resistance to environmental change or disturbance, by the roles each species plays within it, by the roles each community plays within larger landscapes, and by the economic and other values of key species and communities to humans.

Map 3-2 shows physiographic regions of the West. Map 3-3 shows vegetation zones of the West.

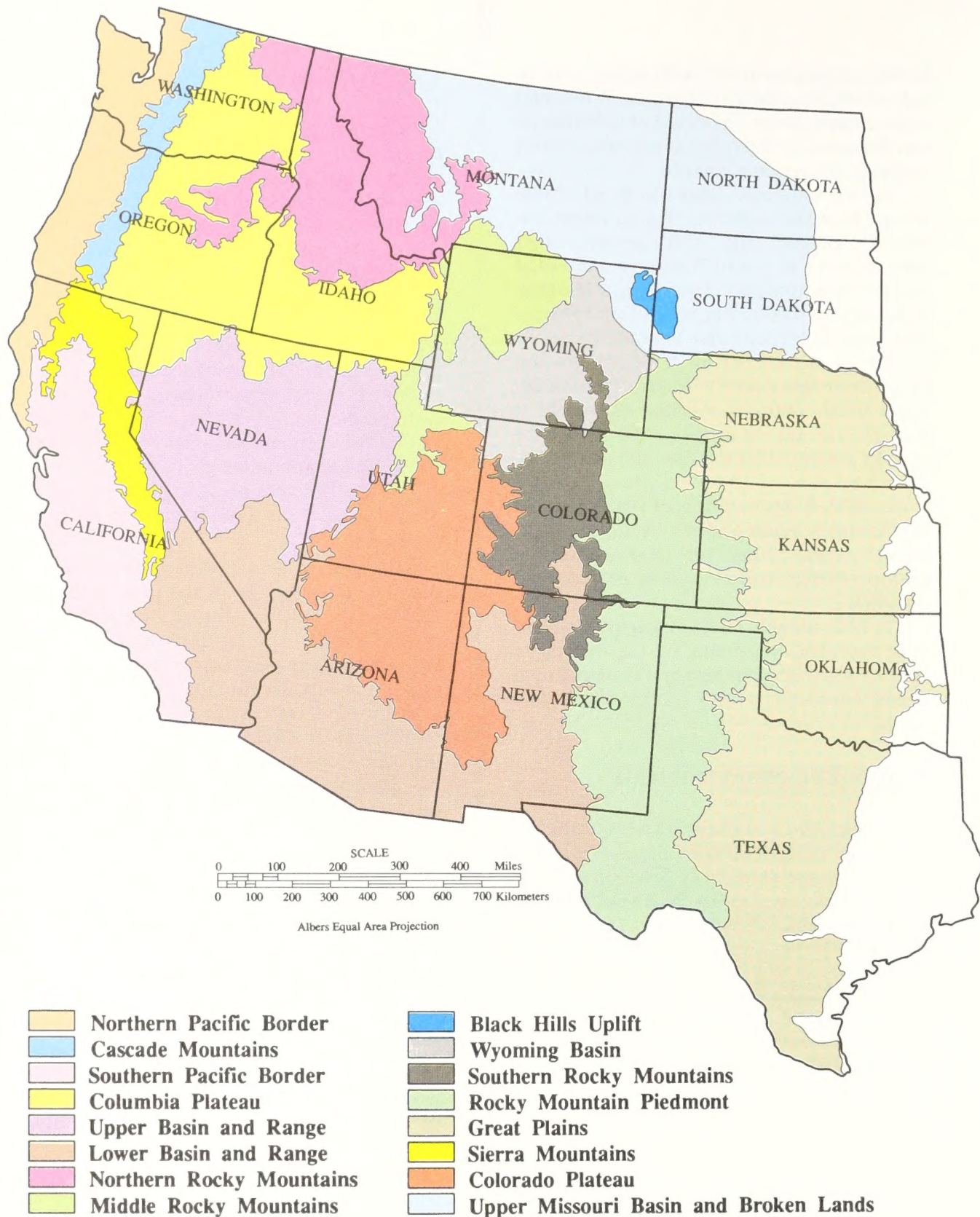
The pattern of vegetation in North America has fluctuated widely in the past 10,000 to 12,000 years, following the melting of the continental glaciers. During the postglacial period, the climate was notably warmer and cooler than today. The boundaries of forests and shrub-like grasslands have fluctuated accordingly (Mehring and Wigand 1987), as have the boundaries of other drier-site plant communities. Some semiarid pristine systems in the West can barely reach stability, and some may have been remnants of more favorable climatic conditions. A trend toward greater aridity and increasing xerophytic woody plants may have already existed. When Europeans saw rangelands in western North America, they observed ecosystems that were in a state of flux, but they often interpreted the condition as being static.

Before European settlement, fire was the most common influence on the landscape in the intermountain West (Gruell 1983), and in most of the Southwest (Wright 1990). But in drier parts of the West, the significance of the effects of fire on vegetation is difficult to separate from the effects of drought (Wright 1990). Woody species have become dominant in areas where frequent fires used to control them. Successional changes on some land today did not likely happen before the 1600s, when frequent fires suppressed woody vegetation (Gruell 1983).

After Europeans settled the West, grazing and cultivation reduced fuels, and organized fire



# Map 3-2. Physiographic Regions



Source: BLM. 1979. Physiographic Regions (United States.)  
Denver, CO: BLM Service Center. (Base map: Potential  
Natural Vegetation of the Conterminous United States by  
A.W. Kuchler.)



# Map 3-3. Vegetation Zones



Source: U.S. Department of Agriculture, U.S. Forest Service, Forest & Range Ecosystems of the United States, 1977



suppression began. Thus, the number and size of fires was drastically decreased (Gruell 1983; Swetnam 1990). Fire exclusion has most affected ecotones, where naturally occurring fires previously removed woody species.

Managing ecosystems requires knowledge of the effects of climate, especially drought, insects, disease, livestock grazing, browsing by wild ungulates, fire, elevation, latitude, slope, temperature inversions, and cold air drainages (West and Van Pelt 1987). Knowledge of the frequency and consequences of natural disturbances is needed to understand what environmental pressures vegetation has adapted to, the kinds or amounts of vegetation a community can support, and the effects of treating the community.

A land manager chooses to encourage or retard plant succession to achieve the vegetation community that best meets multiple resource management objectives. In many arid and semi-arid areas of the West, removing livestock grazing pressure alone does not dramatically or rapidly change vegetation (Potter and Krenetsky 1967). Present vegetation communities are a product of past human use and alteration of former disturbance regimes, but are subject to many demands and expectations.

Noxious plants are a major concern on most western rangelands. Most noxious plants take advantage of vegetation communities under stress or disturbed by fire or heavy grazing and occupy the interspaces to get a foothold in the plant community. Opportunistic noxious plants include cheatgrass, medusahead, annual mustards, Russian thistle, Canada thistle, Scotch thistle, musk thistle, yellow toadflax, and halogeton. Other noxious plants can become established in pristine vegetation communities and over time dominate the site. Noxious plants include leafy spurge; Russian, spotted, and diffuse knapweed; and yellow starthistle. Noxious plants are common and usually increase in all ecosystems in the West. Once established, noxious plants spread rapidly, becoming increasingly difficult to control. Economic losses as a result of reductions in land productivity for livestock grazing and reductions in wildlife habitat are significant (BLM 1991a).

Disclimax is the term for a stable ecological community that has resulted from repeated or continuous disturbance by humans, domestic animals, or natural events. Disclimax communities differ completely from communities that previously occupied an area and have little

chance of reverting to the original community. Cheatgrass and medusahead annual rangelands fit this category, as do sites dominated by dense sagebrush or juniper communities that have displaced perennial grasses. A disclimax community may diminish the biological diversity of a landscape. If it becomes too large, its state of disclimax can significantly change the objectives for managing all resources. For communities that are at risk of disclimax, BLM and Forest Service are forced to mechanically treat the vegetation, usually by seeding or chaining.

## Upland

Upland vegetation on most western rangelands is heavily affected by the amount and timing of precipitation during the year. Properly managed upland areas in the 12-inch or more precipitation zone may significantly improve within 20 years. The higher precipitation zones improve more rapidly because:

- Soils are generally more fertile, deeper, and more productive in higher precipitation zones.
- Generally, the higher the precipitation the more production of vegetation through seedling establishment, sprouting, and growth.
- Soils are usually less fertile, shallow, and less productive in the lower precipitation zones.
- Seedlings do not as successfully become established in the lower precipitation areas as in the higher precipitation areas as a result of poor soils and competition for moisture with other plants.
- Areas that have low precipitation and poor soils have less vegetation than the higher precipitation areas. To survive in the drier zones plants need large spaces between them to spread their roots and capture moisture. Areas with higher precipitation have enough moisture and productive soils to allow plants to survive close to each other.
- The ability of vegetation to respond to improved management is influenced significantly by soil productivity and the amount



of moisture to induce growth. In the lower precipitation areas, vegetation struggles to produce seeds and grow.

## Sagebrush

Within the upper and lower basin and range provinces, the Colorado Plateau, the Columbia Plateau, and the Wyoming basins, sagebrush often dominates dry slopes and lava bed flats, ancient lakebeds, and broad alluvial basins. Most of the sagebrush zone is found at elevations from 2,000 to 7,000 feet. Where sagebrush dominates below 7,000 feet, annual precipitation varies between 8 and 20 inches (Wright and others 1979).

The typical sagebrush community has fairly dense to open vegetation with nonspiny shrubs 2 to 6 feet high and an understory of perennial and annual grasses and forbs (Cronquist and others 1972). Increasingly to the south, however, sagebrush may grow to the virtual exclusion of grasses and does not represent a grazing disclimax. Important shrubs in the sagebrush community include big sagebrush, black sagebrush, low sagebrush, rabbitbrushes, Mormon tea, curly leaf mountain mahogany, bitterbrush, snowberry, and horsebrush. Important perennial grasses include Sandberg bluegrass, bluebunch wheatgrass, western wheatgrass, Idaho fescue, Great Basin wildrye, junegrass, Indian ricegrass, squirreltail, muttongrass, and needle-and-thread grass. Red brome, medusahead, and cheatgrass are introduced annual grasses that have become abundant. Common forbs include wild onion, sego lily, balsam root, mulesear, Indian paintbrush, larkspur, tarweed, rubberweed, lupine, phlox, locoweed, and annual mustards (Cronquist and others 1972).

During the short period after snow melts moisture and temperature are most favorable for growth. Precipitation during the growing season is less dependable for remoisturizing soil. The growing season also has high temperatures, which promote more evapotranspiration than occurs during snow melt. Grasses and forbs depend on resources in the surface soil between shrubs and therefore have a constrained growing period.

Sagebrush is extremely competitive when its environment has just the right characteristics. It can draw its moisture and nutrients from

deep in the profile or through fibrous roots near the surface, giving it high resistance to environmental extremes. It can survive more than 40 years, has reproductive capacity through abundant and consistent seed set, and in its foliage produces secondary chemical compounds that probably discourage herbivores from consuming it. Insects and fire appear to be the main sagebrush killers (West 1983).

Disturbances from cultivation, fire, herbicides, excessive grazing, and insects, combined with natural variability, have changed the botanical composition and productivity of native sagebrush communities. Since the beginning of European settlement, the number of species native to sagebrush communities has declined, sagebrush has become more abundant, and many exotic plants, mostly annuals, have invaded the communities. The sagebrush zone itself is ecologically stable, and its boundaries closely resemble those at the time of European settlement (Tisdale and Hironaka 1981). At higher elevations the sagebrush zone often becomes integrated with ponderosa pine, Douglas-fir, and aspen. Western juniper is invading many portions of sagebrush ecosystems at elevations below 5,000 feet.

Before 1900, livestock greatly reduced the more palatable herbaceous component of the sagebrush region, as most varieties of sagebrush are not highly palatable to livestock, especially during the growing season. The affected sagebrush areas were susceptible to invasion by aggressive, less palatable plants, particularly non-native annuals such as cheatgrass and medusahead (Brown 1982; Tisdale and Hironaka 1981; West 1983).

Populations of annuals cannot be reduced through ecological succession within a reasonable timeframe, not even with improved management systems or elimination of livestock grazing. Cheatgrass produces enormous numbers of seedlings after the first fall rain, and the root system can grow throughout most of the winter. Native perennial grasses have higher soil temperature thresholds for growth. By spring, annuals have built extensive root systems that can use soil moisture earlier and at higher rates than native grasses (West 1983). The annual grasses generally dry out by mid-June, and the dry stands are susceptible to wildfire.

Livestock grazing can reduce the amount of cheatgrass on rangelands and thus the chance of fires. If cheatgrass is reduced in the spring,



less cheatgrass is present to burn after mid-June. But managers must ensure that early livestock grazing will not degrade the health of perennial grasses. A significant problem is created when perennial grasses are replaced with medusahead, cheatgrass, and other annual plants.

The fire history of the sagebrush region has not been firmly established, but fire was probably uncommon on drier sites because of sparse fuels and more frequent on more mesic sites with greater herbaceous production (Wright and others 1979). Burning every few years or burning in early summer depletes perennial grasses and encourages the growth of annuals, which create flammable fuel and further increase fire frequency (Wright and Bailey 1982; West 1983). Once established, cheatgrass may inhibit the growth of perennial plants native to the site, thereby perpetuating the cheatgrass fire cycle, leading to a spiral of deterioration through depletion of volatile nutrients and accelerated soil erosion (West 1983). The incidence of juniper is constantly increasing in this ecosystem, possibly due to the suppression of wildfires.

Crested wheatgrass seedlings represent a significant portion of sagebrush and other communities in southeast Oregon and southern Idaho. Some of the seedlings were planted when the communities were being rehabilitated after wildfires. Crested wheatgrass was commonly used because it was inexpensive and highly adaptable, provided good forage, and improved watersheds. But during drought or other stressful times, annual noxious plants such as halogeton, cheatgrass, and Russian thistle may invade and dominate crested wheatgrass sites. If livestock management was improved, regardless of precipitation factors, crested wheatgrass usually stopped the invasion of annual plants and dominated the site again. Now a better approach, though more expensive, is used by developing a mixture of seeds (sagebrush, native perennial grasses, and other plants) to maintain rangeland biodiversity during rehabilitation.

Sagebrush watershed systems routinely undergo extreme flooding. Where runoff water is concentrated, erosional rills and gully systems have developed. Water yield from most sagebrush watershed systems is less than 1 inch annually, but 3 to 4 inches may build up on wetter sites (Hibbert 1979).

Larger streams and rivers typically originate at higher elevations and flow through more arid sagebrush regions. Stream systems that are rela-

tively stable, without incised channels, and in soils with good water-holding capacity can store large amounts of water during overbank flooding, resulting in local groundwater development. Incised streams often do not support nearby groundwater systems and result in ephemeral conditions.

Water quality is generally acceptable for most wildlife and livestock use, with pH above 7.0, high alkalinity, and elevated dissolved solids (greater than 200 milligrams per liter). Usually, temperature and sediment are the limiting water quality criteria for fisheries. Temperature extremes respond to the air temperature, topographic and vegetation shading, and the associated groundwater system.

Though less biologically diverse than most vegetation communities, sagebrush communities are wide and elevated and create significant wildlife habitats. Sagebrush is typically associated with cold deserts, whose snow and cold weather cause wildlife to seasonally shift habitats. Sagebrush communities commonly have pinyon-juniper or conifer forests above and saltbush, greasewood, riparian, grassland, or other sagebrush flats below. Wildlife can use these communities alone or in combination with other habitats.

## Desert Shrub

Desert shrub communities occupy the hot and cold deserts of Arizona, Nevada, Utah, and California. These deserts are dominated by shrubs in open stands, with a large amount of bare soil or desert pavement exposed. Understory vegetation is often sparse at lower elevations except when flushes of annuals are produced by seasonal precipitation in the Mojave and Sonoran deserts.

Desert plants have adapted to the harsh growing conditions in hot and cold deserts in different ways. For example, the vegetation in hot and cold deserts has adapted to receiving 2 to 15 inches of rainfall annually (Benson and Darrow 1981). Phreatophytes, a type of perennial, have extensive root systems that reach water tables. The root systems of perennial shrubs can often access moisture that is deep within soil, as well as shallow roots that compete with herbaceous vegetation for surface moisture. Some plants, such as cacti and other succulents, have special tissue in their stems or leaves to



store moisture and limit moisture losses by minimizing transpiration.

Desert plants have combinations of small leaf size and thick waxes, resins, or pubescence on their leaves, and can lose their leaves and become dormant in response to drought. Annuals germinate, mature, and produce seeds only during favorable temperature and moisture conditions, often within a single season. Desert plants have also adapted to drought caused by high soil salinity or alkalinity by removing excess salts from their tissues and regulating salt uptake from their roots.

The Mojave and Sonoran deserts constitute the hot desert portion of the vegetation zone. Located mostly in California, the Mojave extends into southern Nevada, northwest Arizona, and the tip of southwest Utah. The Mojave Desert lies between the cold desert and the Sonoran Desert. Because of its position, the Mojave shares a combination of the cold desert and Sonoran Desert's climate and plant features (Brown 1982). The Mojave desert's precipitation falls mostly in the winter. The Joshua tree is the most recognized but not the most widespread plant in the Mojave. Common shrubs include creosotebush, bursage, thornbush, shadscale, spiny hopsage, and greasewood. Pickleweed, seep weed, alkali weeds, glassworts, and saltgrass are common plants associated with saline basins. The Mojave Desert is especially rich in annual plants, which are abundant during the rainy season in winter and spring (Brown 1982).

The Sonoran Desert receives mostly summer (and some winter) precipitation, separated by spring and fall drought (Brown 1982). Having a high percentage of trees and large shrubs, the Sonoran Desert is particularly rich in succulents (Benson and Darrow 1981). The saguaro cactus is characteristic of the mostly frost-free portions of the Sonoran Desert. Other common shrubs and succulents include creosotebush, blue palo verde, bursage, mesquite, desert ironwood, allthorn, ocotillo, jojoba, acacia, and variations of *Opuntia*, yucca, and agave. Annual herbs are abundant after summer and winter rains (Benson and Darrow 1981).

Alkali desert shrub communities generally surround the shores of large prehistoric lakebeds or alkali playas that mark the location of dry lakebeds (Fowler and Koch 1982). The vegetation is dominated by variations of saltbush associated with other xeric shrubs. The alkali desert shrub communities are often remnants

of older, more extensive vegetation and provide unique habitats for special status plants and animals.

The effects of historic use on desert shrub communities vary. Ample data exists on the changes in some shrub communities, but the causes of observed change are complex and not always entirely understood. Scientists lack quantitative data on the extent of change in dry regions (Branson 1985).

Fire has never been considered an important factor in managing desert shrub communities. The chance of wildfires is low since desert shrub communities have low surface biomasses and individual plants are far apart. Livestock grazing, however, is an important factor in managing desert shrub communities, particularly in the cold desert. The degree of change in vegetation, as caused by livestock grazing, depends on the kind of livestock, season and intensity of grazing, and the rangeland's potential for producing vegetation. Observable changes include reduced total cover, palatable shrubs, or grasses and increased exotic annuals or shrubs not eaten by livestock, such as halogeton and Russian thistle (Branson 1985). The palatable shrubs and grasses include black sagebrush, bud sagebrush, winterfat, and Indian ricegrass.

In addition to livestock grazing, disturbances such as building energy and transportation corridors, military operations, surface mining, and recreation have depleted vegetation (Blaisdell and Holmgren 1984).

Hastings and Turner (1965) concluded that warmer temperatures and less rainfall in the past 100 years must be considered the main cause of vegetation change in the Sonoran Desert. But depletion of saguaro populations in parts of the Sonoran Desert has been attributed to suppression of reproduction by livestock grazing (Branson 1985).

Water yield is usually less than 1 inch annually. Most watershed drainages are ephemeral, flowing only during periods of extreme precipitation (Lusby 1979; BLM 1984). Like the sagebrush ecosystem, the few larger surface streams that flow through desert shrub sites originate in higher elevation foothills and mountain areas. Surface water quality is generally poor and limited by sediment, high temperatures, and high dissolved solids.

Because of meager rainfall and some poor soils, the vegetation in hot deserts changes slowly, normally showing a boom and bust pat-



tern in growth. Wildlife in hot deserts have adapted and also tend to slowly respond to changes in vegetation. A challenge in managing hot desert vegetation is to avoid emphasizing common plants and annuals while deemphasizing rare plants and perennials. For example, some annuals can overwhelm a hot desert shrub ecosystem for a few weeks in a year and a few times in a decade. Nongame animals depend on native annuals and some exotic annuals during the long, harsh periods. Nevertheless, perennial grass and forb cover is important to a host of nongame animals in hot deserts. Some native perennials, though grazed by large ungulates, have adapted to hot desert ecosystems.

### Southwest Shrubsteppe

The southwest shrubsteppe vegetation zone occupies the semidesert grasslands of southeast Arizona and southern New Mexico and the northern Chihuahuan Desert.

Elevations of the semidesert grasslands range from 3,300 to 5,000 feet (Brown 1985). More than half of the 10 to 20 inches of annual precipitation falls during the summer growing season (Benson and Darrow 1981). Semidesert grasslands are best developed on deep, well-drained soils on level sites on the higher plains. Their aspect is a grassy landscape broken up by large, well-spaced shrubs. In the Southwest, semiarid grasslands often form an alternating landscape mosaic with Chihuahuan desertscrub.

Large acreages of this grassland are now dominated by mesquite, tarbush, acacia, and creosotebush. Black grama and tobosa are the most characteristic grasses. Other important grasses on the better sites include sideoats grama, hairy grama, bush muhly, vine mesquite, Arizona cottontop, slim tridens, pappus grass, tanglehead, threeawns, and curly mesquite. The introduced perennial Lehmann lovegrass now occupies extensive areas in some western portions and is spreading at the expense of more palatable native grasses (Brown 1985). Other shrubs and succulents characteristic of this grassland include yuccas, bear grass, sotol, agaves, allthorn, sumac, hackberry, ocotillo, acacias, and mimosas. Many variations of cacti grow in the drier sites, especially on outcrops.

The northernmost extensions of the Chihuahuan Desert cover rain shadow basins, outwash plains, and low hills across southern

New Mexico. The Chihuahuan Desert's elevations range from about 3,000 to 5,000 feet. The area receives an annual average of 8 to 12 inches of precipitation, which falls mostly in the summer when evapotranspiration rates are high (Brown 1982). Most perennial vegetation consists of shrubs. Creosotebush, acacias, and tarbush dominate the intermountain plains and lower areas. Mesquite dominates sandy, wind-eroded hummocks. Dense stands of succulents, such as lechuguilla, sotol, yuccas, beargrass, and candelilla, grow on rocky mountain slopes in association with scattered ocotillo and many variations of cacti, including *Opuntia*, *Ferocactus*, *Echinocereus*, *Echinocactus*, and *Mammillaria*. Annuals are important components of the northern Chihuahuan Desert ecosystem during the rainy period of the summer. The prominent understory plants include mariola, goldeneye, desert zinnias, and dogweeds.

The expansion of the Chihuahuan Desert into former grassland is documented (Brown 1982), but how the this desert expanded is not well understood. Indians may have frequently burned desert grasslands before European settlement, preventing encroachment of woody species (Benson and Darrow 1981).

Fewer fires and less livestock overgrazing caused woody communities to expand from sites at lower and higher elevations. Furthermore, cattle helped spread mesquite by depositing undigested mesquite seeds in grasslands (Benson and Darrow 1981).

In some areas, when the ground cover decreased, the topsoil was lost. Eventually the land could no longer support a grassland community (Branson 1985). Thus the damaged shrubland in some parts of the region may be permanent. Fire exclusion is an important factor in the areas that were invaded by woody species. Woody species are continuing to invade areas protected from grazing (Humphrey and Mehrhoff 1958). Others, however, discount the importance of fire, particularly in maintaining brush-free and practically fire-free rangeland in southern New Mexico (Buffington and Herbel 1965).

Hastings and Turner (1965) made a case for climatic trends toward warmer and drier conditions, combined with historic overgrazing, as a cause of vegetation changes in this region, but this theory is not universally accepted (Wright 1980). Other studies have documented that certain woody species such as burroweed are highly



responsive to short-term climatic trends and that such natural causes by themselves can be responsible for dramatic shifts from grasses to shrubs (Martin and Turner 1977). Wright (1980) concluded that in this region, except in black grama uplands, occasional fires in combination with drought, competition, rodents, and lagomorphs (rabbits and hares), played a significant role in controlling shrubs.

Studies by McCormick and Galt (1993) found that perennial grass cover significantly increased on shrubsteppe rangelands in New Mexico between 1952 and 1992. Their average transect showed that perennial grass cover increased from 12 percent in 1952 to 30 percent in 1992, a remarkable finding considering that the 1950s drought, which did not end until 1955, killed most of the perennial grass cover that existed in 1952. McCormick and Galt attributed the reduction in bare ground and improvement in conditions to a combination of favorable rainfall years in the 1980s, increased water developments, conservative livestock stocking rates, and improved livestock distribution due to more fences.

Most watershed drainages are ephemeral, flowing only during periods of extreme precipitation. Permanent streams depend on water from higher elevation watersheds or large groundwater systems. Places that have no river systems have seeps, springs, and wells as permanent water sources. Other pondlike water sources, natural or artificial, form from occasional precipitation.

## Chaparral-Mountain Shrub

The chaparral-mountain shrub vegetation type discontinuously occupies foothills, mountain slopes, and canyon habitats ranging from southern Oregon to the Mexican border, and from sea level to more than 5,000 feet. Composites of interior chaparral and mountain shrub communities, chaparral-mountain shrub communities typically consist of dense to moderately open stands of evergreen shrubs that grow to roughly uniform height. Most chaparral shrubs are deep rooted, sprout readily from the root crown, and regenerate quickly after burning (Brown 1982).

Shrub live oak is a common dominant of the interior chaparral. Associated shrubs include manzanita, mountain mahogany; yellowleaf

silk tassel; sumac; hollyleaf buckthorn; chamise; red shank; and several sophora, ceanothus, and other oak species. Important grasses include sideoats and hairy grama, cane bluestem, plains lovegrass, threeawns, and wolftail. These grasses are largely confined to recently burned areas and rocky, protected sites. Forbs are not particularly abundant except during brief periods after burns (Brown 1982).

Shrub densities in some areas of interior chaparral have increased since the turn of the century. Reduced fire frequency is usually considered the main cause of this trend (Brown 1982; Herbel 1985). Significant changes in vegetation are not well documented for the mountain shrub type. Past livestock grazing generally depleted palatable herbaceous components (Brown 1982), and fire frequency has declined. Excluding fire has contributed to decadent stands of shrubs that have lost most of their value as wildlife browse.

Surface water is limited in the chaparral-mountain shrub community. Precipitation often falls in thunderstorms. Despite the high runoff and flash flooding in ephemeral washes caused by the slope of chaparral-mountain shrub lands, the dense vegetation of deciduous and evergreen trees and understory brush reduces erosion. The headwaters of surface water streams are typically in the mountains near this community.

The chaparral-mountain shrub is the most widely scattered vegetation community in the West. Because it falls within the mid-elevation montane, many animals may descend or ascend during winter or summer to this community to graze. Openings in chaparral-mountain shrub communities can create an abundance of herbaceous and shrubby forage for several years. But overgrazing reduces the number of desirable herbaceous and browse plants, increasing unpalatable shrubs, decreasing ground cover, and increasing erosion in steep areas. Overgrazed areas may be classified as nonfunctioning or functioning but subject to degradation.

## Pinyon-Juniper

The pinyon-juniper vegetation type grows at midelevations on mountain slopes within and next to the Great Basin. Pinyon-juniper is a cold-adapted evergreen woodland with the unequal dominance of two conifers, juniper and pinyon pine.



The pinyon-juniper woodland reaches its greatest development on mesas, plateaus, slopes, and ridges from 3,200 to 8,400 feet (Blackburn and Tueller 1970; Evans 1988). Precipitation ranges from 10 to 25 inches annually (Blackburn and Tueller 1970).

The eastern woodlands receive more summer precipitation than western areas, where most precipitation falls during the winter as snow (Brown 1982). The trees are rarely taller than 36 feet and may present a closed canopy of one or a variety of kinds of trees without scanty understory vegetation. Or the community may appear as an open stand of scattered trees with a diverse and well-developed understory. Pinyon-juniper communities survive on a wide variety of soils, ranging from shallow to moderately deep and from coarse and rocky to fine compacted clays.

Typically, juniper grows in pure stands at lower elevations of the zone. Growing in mixed woodlands at middle elevations, pinyon eventually replaces juniper at the upper limits of the zone (Cronquist and others 1972). The woodlands have a variety of trees, shrubs, geographic features, and herbaceous understories.

Rocky Mountain juniper, Utah juniper, and oneseed juniper often grow together (Cronquist and others 1972). In the dry mountains of southern New Mexico and below the Mogollon Rim in Arizona, Rocky Mountain and Utah juniper and doubleleaf pinyon disappear, and alligator juniper (a sprouting variation of juniper), Emory oak, gray oak, and Mexican pinyon appear (Brown 1982). The associated understory of shrubs, grasses, and forbs in juniper communities commonly consists of a variety of vegetation from sites near woodland communities.

The correlation between pinyon-juniper and soil properties, climate, or topography highly varies. Pinyon and juniper can become dominant wherever their moisture and temperature requirements are met (Brackley 1987). The rangeland of the pinyon-juniper community types overlaps that of many other vegetation types, including sagebrush, semidesert and plains grassland, mountain shrub, and ponderosa pine (West and Van Pelt 1987).

Fires, believed to have been widespread in most pinyon-juniper communities before European settlement, limited the production of the plants, (Burkhardt and Tisdale 1976; Brackley 1987; Branson 1985; Leonard and others 1987; West and Van Pelt 1987; Tausch and others 1981;

Wright 1990) particularly where pinyon-juniper merged into other communities with more fire-tolerant plants. Wright (1990) stated, "Historically, fire has been the dominant force controlling the distribution of pinyon-juniper, particularly juniper, but fire cannot be separated from the effects of drought and grazing."

Droughts and competition from grass probably slowed the invasion of juniper into adjacent shrublands, particularly at lower elevations. Because young pinyon and juniper trees are easily killed by fire, occasional fires would kill most trees established in an area. West and Van Pelt (1987) believe that many pinyon-juniper sites used to cycle between grass-shrub domination, and pinyon-juniper communities, with fire as the chief driving factor. Surviving stands of pinyon and juniper, such as in the upper Rio Grande River drainage, are in fire resistant areas (Branson 1985). Pinyon-juniper communities may be in areas with rough topography or poor soils that haven't produced enough fuel to carry a fire (Wright and others 1979).

During settlement, livestock grazing significantly reduced the number of fuel fires. The area had fewer fires, and the range and density of pinyon and juniper increased (Burkhardt and Tisdale 1976; Branson 1985; Tausch and others 1981; Wright 1990). Opposing views state that pinyon and juniper are merely reestablishing themselves where they were removed from the 1800s to the 1920s for use in mining and for charcoal, fuelwood, fenceposts, and other uses (Lanner 1977).

The pinyon-juniper community appears to be expanding in the West. The cause of the expansion is not understood. Mehringer and Wigand (1987) argue that the rate and degree of expansion in juniper communities in central Oregon is the same as during other periods within the past 10,000 years and that climate—not grazing or fire exclusion—is the cause. Davis (1987) believes that pinyon and juniper expanded to lower elevations in response to climatic cooling but that the expansion was accelerated by past vegetation disturbances, particularly grazing.

Tausch and others (1981) studied pinyon and juniper age and dominance on 18 mountain ranges in the Great Basin and found many stands of trees to predate the historic period. They found tree dominance to be increasing, particularly at lower elevations. About 30 percent of their plots contained trees that established be-



tween 1845 to 1895. They acknowledge the role of grazing, reduced fire frequency, and revegetation of denuded areas as important in explaining present pinyon and juniper expansion. No juniper trees were found to predate 1880 in a study area in north-central Oregon.

Many of the oldest trees established under sagebrush that has since died, whereas younger trees establish under the canopy of other junipers (Eddleman 1987). The junipers continue to significantly lose understory vegetation (Tausch and others 1981; Brackley 1987; Eddleman 1987; West and Van Pelt 1987), which would normally provide food for livestock and wildlife. In the early successional stages of pinyon-juniper encroachment into an area, livestock management may be used to create a herbaceous plant cover dense enough to restrict conifers germination, further reducing pinyon-juniper regeneration (Bedell 1986).

Few pinyon-juniper areas support a good grass understory. Once established, pinyon-juniper ecosystems are described as the climatic climax dominants (West and others 1979). Eliminating livestock grazing once trees are established would not alter the successional pattern (Doughty 1986). Only practices such as prescribed fire and mechanical and chemical treatment will allow biodiversity to return to pinyon-juniper woodlands (Doughty 1987).

Runoff from pinyon-juniper communities can be extreme, resulting in deeply incised channels and large sediment supplies to downstream areas. But gully erosion is often limited by the shallow depth to bedrock.

Annual water yield is generally less than 1 inch although wetter sites may approach 3 inches (Hibbert 1979). Streamflow is mostly intermittent and ephemeral.

Water quality is generally poor because of high dissolved solids, sediment, and temperature. Use of the water is therefore limited to wildlife and livestock drinking water.

Past management practices has significantly changed the density of pinyon and juniper tree stands. Stand densities have increased, often to the detriment of valuable forage and cover plants, lowering the quality of some wildlife habitat. This effect has resulted in a more monotypic vegetation structure. Management is often aimed at reducing tree densities to improve associated grass and forb forage plants volumes and to rec-

reate the lost edge habitat and habitat diversity. Dense juniper stands mainly offer high-quality nesting and thermal cover. Pinyon stands may have similar values, but in addition produce pinyon nuts, which are an excellent wildlife food.

Composition and cover of the understory grasses and forbs are critical to the values of this vegetation type as quality wildlife habitat. Less valuable as wildlife habitat are areas lacking understory grasses and forbs due to stand density or other factors and areas with extensive bare ground promoting erosion.

## Mountain and Plateau Grasslands

The mountain and plateau grasslands are located on noncontiguous areas at moderate to high elevations (3,000 to more than 9,000 feet) in the West. These grasslands often occur within a vegetation mosaic created by the complex environment of the Rocky Mountains. The grasslands ecosystem gets from 8 to 30 inches of precipitation annually (Garrison and others 1977; Mueggler and Stewart 1980), at least half of it usually falling during the growing season. The topography of mountain and plateau grasslands ranges from level areas or valley floors to alluvial benches and foothills or steep mountain slopes. The area's soil characteristics range from deep and loamy to poorly drained or fairly dry and rocky or mildly alkaline to mildly acidic (Mueggler and Stewart 1980).

In mountain and plateau grasslands, grass is usually the dominant vegetation, followed by forbs and shrubs. Important grasses in mountain and plateau grasslands include grama grasses, bromes, bluegrasses, oatgrasses, sedges, wheatgrasses, fescues, needlegrasses, and Junegrass. Diverse throughout the region, the forb component varies with site, latitude, and management. Shrubs include fringed sagebrush, rabbitbrushes, snakeweed, shrubby cinquefoils, wild roses, and horsebrush (Mueggler and Stewart 1980). Water yield in this vegetation type is low, resulting in intermittent streamflow.

These grasslands contains many different wildlife habitats, from high mountain meadows to southern plateau grasslands. Also included in this variety are the edges of grassland communities with many forest and brushland types.



## Plains Grasslands

The plains grasslands vegetation type is found in the Great Plains, stretching from eastern Montana, North Dakota, and western Minnesota southward to eastern New Mexico and Texas. The western half of the plains grasslands forms a broad, flat belt of land sloping gradually eastward from the foothills of the Rocky Mountains. Mixed and shortgrass communities are most commonly found on federal lands within this vegetation type.

The short grassland communities stretch from southeast New Mexico through eastern Colorado to southeast Wyoming. Annual precipitation ranges from 11 to 20 inches, and elevations range from 6,000 feet on the western edge to 3,000 feet on the southern edge. Dominant grasses are buffalograss and blue grama, with smaller amounts of threeawns, lovegrass, tridens, sand dropseed, sideoats grama, tobosa, galleta, vine mesquite, and bush muhly. Forbs are seldom a major component, except during wet years. Dominant woody plants include honey mesquite, shinnery oak, sand sagebrush, snakeweed, yucca, fourwing saltbush, cholla, and prickly pear.

The mixed grass communities stretch from northeast Wyoming through North and South Dakota and eastern Montana. Precipitation varies from 20 to 28 inches, increasing from west to east. Elevation ranges from about 3,000 feet at the western edge to 900 feet in Texas (Wright and Bailey 1980). Sedges and cool-season grasses, such as needlegrasses, wheatgrasses, and fescues, dominate the communities of Montana and North and South Dakota. Warm season grasses, particularly blue grama, also grow in mixed grass communities and increase in dominance to the south.

Other important grasses in mixed grass communities include green needlegrass, prairie sandreed, needle-and-thread grass, junegrass, sand dropseed, buffalograss, sideoats grama, threeawns, silver beardgrass, sand bluestem, little bluestem, plains lovegrass, and vine mesquite (Brown 1982). Shrubs found in mixed grass communities include juniper, sand sagebrush, silver buffaloberry, sumac, wild rose, and rabbitbrushes, yucca, snakeweed, cholla, and winterfat. (Brown 1982; Mueggler and Stewart 1980). Forbs may be an important component

of mixed grass communities. Common plants include goldeneye, groundsel, sunflowers, primrose, globemallow, asters, scurf pea, coneflower, and bricklebush (Brown 1982).

Tall grass communities in the plains grassland are restricted to certain soil types and areas where grazing has not been severe. This type is more extensive in the true prairie of the Midwest. Tall grass communities are dominated by big bluestem, little bluestem, Indian grass, switchgrass, and sideoats grama. Associated shrubs include shinnery oak, sandsage, yucca, and mesquite (Brown 1985).

The plains grasslands evolved and adapted to grazing, especially by native herbivores. Scientists believe plains grasslands are mostly controlled by climate. Nevertheless, occasional fires limited woody vegetation to mosaics or a savanna situation (Wright and Bailey 1980). Fire suppression established fire disclimax associations of shrubs in some areas (Brown 1982). Unlike other native grasslands, plains grasslands generally have not been converted by fire suppression and other human activities.

Blue grama-dominated communities in the plains grasslands apparently represent stable states resistant to change caused by heavier grazing, reduced grazing, or removal of grazing (Laycock 1991). In eastern Montana, dense clubmoss occupies low-condition sites dominated by blue grama, further reducing the rate of succession (BLM 1981a).

Several changes can cause an ecosystem to move from one stable state to another (Laycock 1991). For example, although changes in grazing practices, such as a change from season-long use to rest-rotation grazing or even removal of grazing, may not result in succession from mid- to late-seral stages on dense blue grama and clubmoss sites, rapid successional change can result from introducing fire or mechanically disturbing the site. In most of the prairie ecosystem, a reduction in fire frequency for the past 100 years due to fire control is likely a major factor in perpetuating stable low successional states. Lack of disturbance of the soil surface is also a major factor.

Buffalo herds once grazed the plains grasslands, repeatedly disturbing the surface. Large herds would create an effect like shallow plowing. In eastern Montana, mechanical disturbance of the soil surface similar to the hoof action of the buffalo by chisel plowing rapidly



changes vegetation from mid- to late-seral stages (BLM 1981a). Cattle grazing methods designed to cause herd impact through short-duration, high-intensity grazing (Savory 1988) are being applied with success on several ranches in the region, but data on successional change is lacking. Applying such disturbance factors as fire, mechanical treatments, or possibly high-intensity, short-duration grazing will be the key to changes in successional stages on the plains grassland.

The plains grassland included in the Rocky Mountains and High Plains analysis area includes the northern mixed prairie and the short-grass prairie. Both types highly resist grazing, recovering from overgrazing within 3 to 10 years (Holechek and others 1989). Rangeland managers regulate four basic factors in controlling the effects of animals on plants: grazing intensity, timing, frequency, and selective plant consumption.

Grazing intensity has been shown to be the most important factor. In general, the mid grasses (western wheatgrass) resist grazing less than shortgrasses (blue grama), so use levels must be keyed to mid grasses to maintain or increase their composition in the plant community. For maintenance of good condition, a use rate of 40 to 50 percent is recommended, with lower use recommended for rangelands in poor condition (Holechek and others 1989). Under moderate use, several grazing systems can be used to manage the timing, frequency, and selectivity of grazing to effectively maintain or improve conditions. Rest-rotation grazing has multiple use benefits because ungrazed pastures can be used by wildlife and for other purposes.

Most upland sites with deep soils in the plains grasslands have a low erosion hazard under moderate or even heavy grazing because of the amount of ground cover they produce. The areas most susceptible to erosion are the shallow soils with limited ground cover. Functioning at risk or nonfunctioning, the shallow clay badlands are being shaped by the natural forces of erosion. Without adequate ground cover, livestock grazing would result in accelerated erosion.

## Annual Grasslands

Annual grasslands occur in California, especially on small plains and gently rolling hills scattered throughout southern California, the

Central Valley, and in the coastal mountains as far north as Humboldt County. Annual grasslands grow at elevations ranging from sea level to 4,000 feet. Relicts of the pristine California prairie are found within small parcels of annual grasslands.

Consisting mainly of annual plants, annual grasslands are open and often develop as the understory to parts of other ecosystems. Fall rains cause the germination of annual grassland plants that grow slowly during winter, then grow rapidly in the spring as temperatures rise. Large amounts of standing dead material can be found in the summer in years of abundant rainfall and light grazing. Heavy spring grazing favors the growth of summer-annual forbs such as tarweed and turkey mullen and reduces standing dead material. On good sites, herbage yield may be as high as 4,400 pounds per acre (Garrison and others 1977).

Dominating annual grasslands are such introduced annual grasses as wild oats, soft chess, riggut brome, red brome, wild barley, and fox-tail fescue. Common forbs include redstem filaree, broadstem filaree, turkey mullen, true clovers, and burr clover. Perennial grasses that are found in moist, lightly grazed or relict areas include Idaho fescue and purple needlegrass.

The lower elevations of the annual grassland ecosystem are irrigated and make rich farm land. The upper elevations are grazed. Lands near urban areas also receive heavy recreational use.

With the exception of the Tulare Lake Basin in the south, streams drain the annual grasslands through the delta and out to San Francisco Bay. Surface waters are abundant. The Sacramento and San Joaquin are the region's main rivers. Both flow into the delta. Surface water is used mainly for agriculture and urban purposes. The California annual grassland ecosystem is now an intensive agricultural region with productive soils, gentle slopes, and a long growing season.

Livestock grazing favors the development of low-growing, early spring maturing forbs and summer annuals. Without grazing, the annual grass rangeland is often dominated by dense stands of grasses such as riggut brome and wild oats.

Loss of most of California's annual grassland to farming and development makes the remaining portions of federal land important for maintaining wildlife habitat. BLM's California offices are actively conserving annual grasslands whenever possible.



## Alpine Grasslands

Beginning at the upper limits of tree growth, alpine grasslands extend upward to the exposed rocks of mountain tops. At the lower border of these grasslands shrubby trees form a transition zone above coniferous forests. Alpine communities have similar combinations of vegetation throughout, including phlox, clovers, alpine avens, yarrow, alpine sedge, alpine bluegrass, elk sedge, spikerush, and tufted hairgrass. The willow communities typically consist of alpine willow, bareground willow, tealeaf willow, and snow willow. Alpine meadow communities grow on sheltered benches, slopes, and level areas where soils are well developed. Alpine marshes replace ponds or develop wherever springs and melting snowbanks contribute to a continuously moist habitat. Glaciation created open landscapes, cirques, hanging terraces, and moraines in alpine areas.

Alpine hydrology is dominated by the amount, distribution, and melting of snow. The annual water yield amounts to 75 percent or more of the annual precipitation (Johnston and Brown 1979). Streamflow is mostly perennial.

## Coniferous and Deciduous Forests

Coniferous and deciduous forests grow in the Rocky Mountains; the Sierra Nevada; the Cascade Range; and the mountains of the upper and lower Basin and Range Provinces, the Colorado Plateau, and the Columbia Plateau. Species dominance varies by altitude, latitude, slope, aspect or other topographical position, soil characteristics, and climatic regime. Important forest communities associated with western rangelands include ponderosa pine, Douglas-fir, aspen, lodgepole pine, hemlock-spruce, cedar-hemlock, spruce-fir, redwood, and western hardwood.

Climax ponderosa pine grows at lower elevations and on warmer, drier sites within coniferous and deciduous forests, typically having lower boundaries with pinyon-juniper woodlands or chaparral-mountain shrub communities and upper boundaries with mixed conifers. Ponderosa pine is the largest western forest. Old-growth ponderosa forests are often park-like, having old trees interspersed within groups of young trees and a well-developed herbaceous

understory. Older trees tolerate fire better than young trees, which are easily killed (Daubenmire 1952). Small fires that burned through the understory are no longer common, which is probably the reason for today's dense and stagnant stands and understory thickets (Wright and Bailey 1982).

Often grazed, ponderosa pine communities can provide a large variety of forage for livestock and wildlife, including winter and fall transitory big game habitat. These forests produce an average of 500-600 pounds of grass forage per acre in open stands, but less forage with crown closure.

Douglas-fir communities are found from the northern portion of the California Coast Range, through Oregon and Washington, and throughout the Rocky Mountains, generally between the ponderosa pine and spruce-fir communities (Wright and Bailey 1982).

Douglas-fir is more often mixed with other conifers in the southern Rockies. This mixed conifer zone is dominated by Douglas-fir in association with ponderosa pine, white fir, blue spruce, and Englemann spruce. Mature mixed-conifer forests are often dense, with high litter accumulations that inhibit understory growth (Brown 1982). This type may extend into drier areas, following canyons, ravines, and north-facing slopes, existing as islands in the midst of more xerophytic vegetation (Daubenmire 1952).

Ungulates typically confine their use of Douglas-fir communities to disturbed areas, where fire or logging has reduced the overstory. These disturbed lands produce from 1,000 to 3,000 pounds of grass forage per acre, as opposed to 50 to 150 pounds per acre on undisturbed sites.

With a range coinciding closely with Douglas-fir, quaking aspen is the most widely distributed native North American tree. It may form extensive pure stands or be a minor component of other forest types. The aspen is a clonal species with an extensive root system that gives rise to shoots forming new trees genetically identical to the parent. The clone consists of all the genetically identical stems. An aspen stand may consist of one or many clones, which may persist for thousands of years.

Fire is responsible for the abundance and even-aged structure of most aspen stands in the West. Without human intervention, fire appears to be needed for the continued well-being of



aspen on most sites. Most stands will die out or be replaced by conifers without disturbance (DeByle and Winokur 1985). In many areas aspen stands are declining in acreage and vigor. Many believe that this decline resulted from past fire control and overgrazing of sprouts by elk and livestock.

Lodgepole pine grows mainly in the central and northern Rocky Mountain of Colorado, Wyoming, Montana, Utah, Idaho, and Oregon. It is also found in the higher mountains of southern California.

Lodgepole pine tends to dominate its communities, often forming dense, pure stands with little understory. Occasional associates include aspen, Douglas-fir, ponderosa pine, and mountain hemlock. The amount of understory is weakly associated with overstory density (Bartolome 1983). The understory can vary from being virtually absent to a rich herbaceous layer next to meadow edges. Often invading riparian habitats, lodgepole pine can have a substantial understory of bitterbrush, Idaho fescue, needlegrass, oatgrass, and wildryes. The amount and quality of forage growing in these forests vary by successional stages. Fire plays an important role in the origin and maintenance of lodgepole pine forests.

Cedar-hemlock forests grow in northern Idaho and northwest Montana where the westerly winds carry oceanic influence as far inland as the Continental Divide. Douglas-fir and western white pine are common associates. Understory in this zone is a rich growth of shrubs and herbs (Wright and Bailey 1982).

Hemlock-spruce communities extend south from British Columbia along the Washington and Oregon coasts and a portion of the Cascade Mountains in Washington. Elevations range from 200 to 4,000 feet. The dominant species are Sitka spruce and western hemlock. Western red cedar, Douglas-fir, and grand fir may also be present to a lesser degree. Common understory plants include vine maple, red whortleberry, Cascades mohonia, twin flower, California dewberry, coast rhododendron, holly fern, and cutleaf fern. The dense overstory reduces forage production.

The spruce-fir community has open to dense evergreen forests and patches of shrubby undergrowth with scattered herbs. Composition of the overstory varies widely but is usually dominated by some combination of red fir, Englemann spruce, subalpine fir, mountain hem-

lock, white bark pine, western white pine, lodgepole pine, foxtail pine, limber pine, and bristlecone pine.

Spruce-fir communities often form dense stands and deficient herbaceous understories because of shading and considerable litter accumulation. Thus, spruce-fir communities are poor sources of forage. Most forage is confined to meadows and natural parks within the forest matrix. Large clearcut blocks within the red fir component can produce from 600 to 1,000 pounds of forage per acre. Aspen often becomes dominant after fire or other disturbances.

The redwood community is a composite name for a variety of mixed conifers that grow within the coastal influence: Sitka spruce, grand fir, redwood, Douglas-fir, and red alder. The redwood community is restricted to the coastal areas of California and southern Oregon. Redwood communities can be grazed. The diverse understory vegetation includes many shrubs, forbs, ferns, and grasses.

Western hardwood communities, sometimes called oak woodlands, grow in California and the western interior valleys of Oregon, especially the foothills surrounding the Central Valley and coastal rangelands in California and the Willamette, Umpqua, and Rogue River valleys in Oregon. Trees in these communities include Oregon white oak, Coulter pine, digger pine, coast live oak, blue oak, valley oak, and interior live oak. Douglas-fir, bigleaf maple, and grand fir may be present. Western hardwoods are major components in a mosaic of valley grassland, chaparral, strips of riparian forests, and other vegetation.

Western hardwood communities have mostly hardwood species in their overstories. Understory vegetation varies by location. The dominant species include poison oak, snowberry, service berry, blackberry, wild oats, bromes, bluegrass, ryegrass, and needlegrass. In open areas, western hardwood communities grow forage associated with valley grassland and are often grazed by livestock.

Streamflow in western hardwood communities is mostly perennial. Water quality in most cases is good. Regulated by the solubility of the geologic formations, typical total dissolved solids are below 100 milligrams/liter. Temperature and dissolved oxygen are suitable for cold water fisheries where topographic and vegetation shading control solar radiation.



Water is abundant in this ecosystem. All of the larger streams and rivers flowing through this ecosystem originate in the mountains. Natural lakes are common, and many large and deep reservoirs have been built on major rivers to provide water for irrigation, power, and domestic and municipal uses. Most natural lakes and ponds are relatively shallow and rich in organic matter. Reservoirs are typically deeper and colder and are relatively nutrient poor. The mountainous terrain and the heavy rainfall associated with this ecosystem have formed complex stream systems. Erosional segments are often confined by the valley walls, and as a result, streamside vegetation is limited to conifers and whatever wetland vegetation can exist in the limited soil. Depositional segments often provide highly productive wetland vegetation.

## Upland Conditions and Trends

The Taylor Grazing Act was passed in 1934 as a result of rangelands being deteriorated during the late 1800s and early 1900s. Changing lifestyles, economic factors, and a more environmentally conscious society have since led to a heightened public concern about the management of federal rangelands. Attitudes toward federal rangelands were reflected in passage of the Federal Land Policy and Management Act in 1976. Further concern about the deteriorated condition of federal rangelands led to passage of the Public Rangelands Improvement Act in 1978. Today, the issue is whether the agencies' stewardship of federal rangelands is adequate to restore and maintain the health of rangeland ecosystems.

Federal rangeland conditions have been reported in a variety of ways over the years. Rangeland assessments today are based more on ecological condition ratings than on forage suitability ratings for livestock. Ecological conditions are typically measured by comparing percent composition, by weight and species, of the existing vegetation to the potential natural plant community that the area can produce.

A community is considered to be at its natural potential when the existing vegetation is between 75 and 100 percent of the site's potential natural plant community. A community in a late seral stage would be between 50 and 74 percent of a site's potential plant community, mid-seral between 25 and 49 percent, and early

seral between 0 to 24 percent of the potential plant community.

In the past, seral stages were referred to as excellent, good, fair, and poor condition. This reference has caused problems for land management agencies using this method. During the 1970s and 1980s the goal of both agencies was to manage the public lands for good and excellent condition uplands. The problem was that management objectives for all resources are seldom met in an ecosystem in its potential natural condition. Wildlife, for instance, occupy different habitats depending on habitat needs at specific seasons of the year. All wildlife need areas for foraging and areas for protection and cover. These areas may not be potential natural communities.

Ideally, an ecosystem with a variety of seral stages offers the diversity of habitats needed by a diversity of wildlife. Managing for only one seral stage in an ecosystem will limit the diversity of the wildlife and harm the ecosystem's health and biodiversity by restricting the diversity of all species of insects, birds, and mammals. In short, the more seral stages represented in an ecosystem the more the plant and animal species and the greater the biodiversity of the ecosystem. However, as a result of past disturbances and human intervention, some ecosystems have been altered to a point that one seral stage is reduced to undesirably low levels. These cases can lead to listing of species as threatened or endangered and create highly controversial management problems such as the old growth forest issues in the Pacific Northwest. As BLM and the Forest Service move into an ecosystem approach to managing federal lands, biodiversity and ecosystem health, including restoration of degraded areas or seral stages in short supply, will become high priorities in developing management objectives.

Trend represents the number of acres of uplands that are moving toward management objectives (upward), that are not moving anywhere or have reached objectives (static), and that are moving away from objectives (downward). Trend and condition data are complicated by variations in precipitation zones, yearly precipitation, other climate factors, and timing of inventories. During years of long droughts, studies may show a downward trend and undesirable conditions because of drought—not because of present management. Grass and forb production may be low, but shrub production may be



normal. Years with abundant precipitation show the opposite results of droughts since the composition by weight of plants, especially of grasses and forbs, is affected by moisture. In wetter years, grass and forb production is greater than shrub production, and studies may show an upward trend and more desirable conditions.

Past improvements in rangeland condition have been largely attributed to management prescriptions that guide grazing use levels; establish proper seasons of use; and recognize and lead to installing proper rangeland improvements, land treatments, and management facilities. The main improvement, however, has largely been in the condition of uplands. In many instances, such upland improvement has not carried over to riparian-wetland areas. Since the mid-1980s, improvement in upland rangeland conditions has tended to level off.

The evolution of rangeland management principles and concepts, changing statutory mandates, and the changing values and expectations of society, demand a new philosophy and approach for assessing rangeland condition. Congress recognized that need and directed the agencies to report, on a continuing basis, the relationship of existing plant communities to resource management plan objectives. This requirement is being met by BLM via a methodology known as the ecological site inventory (ESI), and by the Forest Service reporting acres meeting, moving toward, or not meeting forest plan objectives.

The ESI provides essential resource information (ecological condition, site capability and potential, and surface soil conditions) needed to rate existing vegetation communities in two important ways: (1) in relation to the potential natural community for a particular ecological site and (2) in relation to resource objectives stated in RMPs. BLM's policy is that both forms of evaluation must be kept current and regularly reported.

Inventories are conducted to complete data gaps and update older inventories. Vegetation resource objectives are set for each allotment, and livestock and wildlife use is monitored to ensure proper use of key forage species.

The ecological status of federal land administered by BLM, in millions of acres, is as follows:

POTENTIAL NATURAL COMMUNITY .....	3.3
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LATE SERAL .....	27.8
MID SERAL .....	32.7
EARLY SERAL .....	12.3
UNKNOWN/UNCLASSIFIED <sup>1</sup> .....	5.7

<sup>1</sup> On unknown and unclassified acres, either ecological condition has not been determined or vegetation is lacking, for example, a rock outcrop.

Similar data is used to show changes or trends in the condition of rangeland vegetation. Usually every 2 to 5 years, depending on schedules and local resource objectives, permanent vegetation plots are analyzed and evaluated. Frequency of new plants, plant composition, bare ground, rocks, and litter are observed and used to determine the vegetation's condition.

Plants show a marked response to the timing of rainfall, other climatic factors, and grazing. Grazing is more subtle in its effect on plants. Moderate grazing is less likely to affect vegetation over the long term than continuous heavy grazing, which may reduce the vegetation's vigor, size, and yield.

The present trend in vegetation for federal land administered by BLM is based on agency studies or staff professional judgment. The following information shows national vegetation trends (in millions of acres):

UP .....	28.4
STATIC .....	91.8
DOWN .....	16.6
UNDETERMINED .....	22.1

Proper functioning is the lowest condition needed to ensure ecological health and condition while allowing livestock grazing. BLM and the Forest Service are responsible for managing sustainable, healthy, productive ecosystems to meet the America's environmental, social, economic, aesthetic, and cultural needs. Sustainable ecosystems provide biodiversity, habitat for fish and wildlife, clean drinking water for communities, and healthy and productive federal rangelands.



The watershed is one major landscape management unit having biological, social, economic, and other values. The measurable and manageable components of watersheds equate to elements of ecosystem function, including water cycle, energy balance, and biological diversity. Watersheds consist of interdependent aquatic, riparian, wetland, and upland components that, when functioning properly, capture, store, and safely release moisture; support biological diversity; and help meet social and economic needs.

Uplands are commonly the largest area of the watershed. Hence, the condition of uplands affects the overall health and functioning of rangeland ecosystems. The functioning condition of uplands is a result of the interaction of earth, soils, climates, water, biological activities, fire, and landforms. When uplands are properly functioning, their vegetation and ground cover maintain soil that can sustain natural biotic communities.

But in uplands that are functioning but susceptible to degradation livestock grazing or some other activity has threatened the soil's capability to sustain natural biotic communities. Furthermore, if uplands are not functioning properly, the vegetation and ground cover are not maintaining soil conditions that can sustain natural biotic communities. (See Glossary.)

Although good data exist on seral stage and ecological trend, the concept of proper functioning condition of uplands is relatively new, and little quantitative data exist. Work will be done to define and assess the functioning condition of uplands. To achieve desired resource conditions even more work must be done, such as defining the biological communities that are required to achieve the goals and objectives of land use plans.

Nevertheless, the following estimates have been provided to help facilitate the analyses of BLM-administered uplands discussed in this EIS: 90.5 million acres of uplands are properly functioning, 48 million acres are functioning but susceptible to degradation, and 20.5 million acres are nonfunctioning. Uplands in the unknown category have not been estimated. (These estimates were made by an interdisciplinary team of resource specialists.) The impacts on the functioning condition of uplands that would be caused by each alternative, will be measured by

an expected rate of change. (See Chapter 4 for more information.)

The Forest Service establishes land management objectives, including rangeland resource objectives, in individual national forest land and resource management plans. Vegetation and other resource objectives are established in individual allotment management plans which are tiered to the forest plans.

Monitoring is a key element of the allotment management plans. Livestock and wildlife use is monitored to ensure proper use of key forage species. Long term trend plots are established based on the needs identified in the allotment management plan.

In 1992 the Forest Service implemented a new method for evaluating and reporting how rangeland activities are meeting or progressing toward the objectives established in the forest plans and allotment management plans. The following categories were established: acres meeting forest plan objectives; acres moving toward forest plan objectives; acres not meeting or moving toward forest plan objectives; and acres of undetermined status (unknown).

Approximately 73 million acres of national forest system uplands with range vegetation management objectives were classified into one of these categories for the first time in 1992. Professional resource managers classified lands with range vegetation management objectives into the categories above using existing inventories, monitoring data, and professional judgement. The reliability of these estimates varies with the amount of data available and personal knowledge of the areas. This assessment of the present status of national forest system uplands is summarized below in millions of acres:

MEETING OR MOVING TOWARD OBJECTIVES .....	44.9
NOT MEETING OR MOVING TOWARD OBJECTIVES .....	10.9
UNDETERMINED STATUS .....	17.4

## Riparian

Riparian communities develop near all kinds of vegetation. They make up the least extensive vegetation type in the 13 western states,



with less than 1 percent of the total area (Cooperrider and others 1986). Riparian communities may be classified by several systems, most of which are complex and unsuitable for this type of analysis. The classification system proposed by Dick-Peddle and Hubbard (1977) is suitable for this EIS and delineates the following riparian communities:

**Alpine Riparian Subformation** is limited to riparian areas above timberline. Typical plants are shrubby willows, sedges, rushes, spike-rush, and marsh marigold. This community is probably the rarest riparian community on federal land. The alpine riparian communities are limited to mountain ranges within the sagebrush, pinyon-juniper, mountain and plateau grasslands, and coniferous and deciduous forest communities.

**Montane Riparian Subformation** contains three subseries communities: the willow-alder series, blue spruce series, and the mixed-deciduous series.

**Willow-alder series** includes several species of willow and alders, bog birch, water birch, dogwood, aspen, currant, geranium, cinquefoil, cow parsnip, and sedges. This series is most closely associated with the mountain and plateau grasslands, coniferous, and deciduous forests.

**Blue spruce series** contain the blue spruce and combinations of Douglas-fir, subalpine fir, white serviceberry, carex, grasses, and geranium. This series is also associated with the mountain and plateau grasslands, coniferous and deciduous forests, higher elevation sagebrush, chaparral and mountain shrub, and pinyon-juniper communities.

**Mixed-deciduous series** include a variety of communities of willow-dogwood; alder-willow; boxelder-ash-walnut; sycamore; and hackberry, junipers, ash, western oaks, cottonwoods, maple, and others. Found in all analysis areas, this series includes a wide variety of understory vegetation.

**Arroyo-Floodplain Riparian Sub-Formation** contains the arroyo scrub series and the floodplain (bosque) series.

**Arroyo series** grow only in the driest riparian situations, generally with only seasonal flooding. Most plants in riparian areas are also found in the uplands but reach a larger size in the drainages because of the presence of flood or subsurface water. Growing in this series are the greasewood, rabbitbrush, desert

willow-brickbush, and the burroweed-four-winged saltbush associations. Big sagebrush, seepwillow, desert broom, arrowweed, and the nonnative saltcedar are also found within the arroyo series. These plants mainly grow in the sagebrush, desert shrub, and southwest shrubsteppe communities.

**Floodplain (bosque) series** includes the cottonwood, cottonwood-willow, mesquite, arrowweed-seepwillow, mixed bosque, and saltcedar associations. The floodplain series covers wide areas that support a variety of subordinate understory vegetation. The cottonwood-willow association grows in most analysis areas. Saltcedar, a rapidly spreading exotic, grows in most analysis areas except for the coniferous or deciduous communities. The mesquite, arrowweed-seepwillow, and mixed bosque associations grow mainly in desert shrub and southwest shrubsteppe communities.

In the eastern portions of the plains grassland zone, riparian vegetation adopts some of the characteristics of upland deciduous forests. In Oklahoma, riparian trees decrease in height and vigor in the transition from the moist East to the arid West. In the East, baldcypress, sweetgum, sycamore, river birch, and black gum are common. Elms, hackberry, walnut, black locust, and honey locust are dominant in the central region, but are secondary trees in the East. In the West, cottonwood, willow, elm, and boxelder are common but are smaller and more widely spaced than in the East (Brinson and others 1981).

## Riparian, Wetlands, and Aquatic Communities

Because of their productivity and other values, riparian communities are critically significant and have received continuous intensive use since before European settlement (Branson 1985). Riparian communities are the most severely altered ecosystems in the U.S. (Brinson and others 1981). It is estimated that 70 to 90 percent of the natural riparian ecosystems have been lost because of human activities, and up to 80 percent of the remaining areas are in unsatisfactory condition and are dominated by human activities (Cooperrider and others 1986).

Riparian communities makes up approximately 1 percent of federal land. (See Table 3-6.)





<b>Table 3-6: Riparian Vegetation on Federal Land</b>			
<b>Administrative Agency</b>	<b>Acres of Public Lands</b>	<b>Acres of Rip. Veg.</b>	<b>% Riparian Veg.</b>
Bureau of Land Management	177.3 million	1.0 million	0.56%
USDA Forest Service	145.5 million	2.2 million	1.51%
<b>Totals</b>	<b>322.8 million</b>	<b>3.2 million</b>	<b>0.99%</b>

The most biologically diverse habitats on federal land are those associated with riparian communities. Undisturbed riparian communities provide abundant food, cover, and water for wildlife, and often contain special ecological features or a combination of features that are not often found in uplands. Consequently, riparian communities are extremely productive and the most valued vegetation zone (Dealy and others 1981; Thomas and others 1979). The importance of riparian ecosystems can be attributed to biological and physical features, including the following (Brinson and others 1981):

- Predominance of woody plant communities;
- Presence of surface water and abundant soil moisture;
- Closeness of diverse structural features (live and dead vegetation, water bodies, nonvegetated substrates), resulting in extensive edge and structurally heterogeneous wildlife habitats;
- Distribution in long corridors that provide protective pathways for wildlife migrations and movements between habitats.

Healthy riparian and wetland areas provide values and benefits far exceeding the small percentage of federal land they occupy. Benefits of proper functioning riparian communities include the following (BLM 1991b):

- improved water quality
- filtration of sediments
- streambank stability
- moderated streamflow (reduced flooding)

- retention of water extending late season flow
- restoration of perennial streamflow
- recharge of groundwater
- protection from accelerated erosion
- aggradation or maintenance of high water table
- increased recreational opportunities
- optimal habitat for fish and wildlife
- increased biological diversity
- increased forage for wildlife and livestock
- enhanced aesthetics

The wildlife group most affected by the quality of riparian habitat is the fisheries community. The quality of fisheries habitat is directly correlated to the health of the riparian community (American Fisheries Society 1980). Riparian vegetation is critical for fish because overhanging vegetation provides escape cover, lowers summer water temperatures through shading, and reduces streambank erosion, which deposits silt in spawning and rearing areas. Healthy riparian systems purify water as it moves through the vegetation by removing sediment. Healthy riparian systems also act as sponges by retaining water in streambanks and aquifers (BLM 1989).

Riparian areas are also important to bird populations. Eighty-two percent of breeding birds in northern Colorado live in riparian areas, and 51 percent of all birds in the Southwest depend on these areas. Riparian areas attract a disproportionate number of migrating birds and



in the spring and 14 times more birds in the fall than surrounding uplands. Other vertebrate also depend on riparian areas (Knopf and others 1988).

Riparian and wetland areas can be essential to many endangered and sensitive plants and animals, such as whooping cranes, bald eagles, merlins, and soft aster. Riparian and wetland habitats may be degraded when livestock and wildlife graze and drink in the area. Often the problem is worse when water and forage are plentiful.

While a few western riparian areas have improved since the West was settled (Branson 1985), most have declined in amount and quality. For example, the lower Colorado River historically had an estimated 5,000 acres of pure cottonwood stands along its banks. By the mid-1970s, only 500 acres remained. Riparian vegetation has been removed at nearly 3,000 acres per year (Ohmart and Anderson 1982). Riparian communities at low elevations have suffered the worst impacts, whereas mountain riparian communities have hardly changed (Brinson and others 1981). Major causes of damage include land clearing, irrigation and related water projects, and flooding under impoundments. The overall assessment of western riparian communities is similar to the nationwide assessment: less than 20 percent of 120 million acres of potential riparian habitat exists (Brinson and others 1981).

Within the scope of this EIS, two aspects of historical change in riparian vegetation are important.

- Past land use practices in livestock grazing, fire management, and timber harvest have significantly affected the status of riparian areas. Most riparian areas are in poor condition because of past management (Cooperrider and others 1986). Excessive amounts of plant biomass have been removed from riparian areas by livestock grazing and timber harvesting for the past 100 years or more. The remaining riparian communities are often relict tree stands, unable to reproduce under existing management.
- In addition to damaging the riparian communities, past management has also de-

graded most of the associated upland vegetation areas, resulting in watersheds of unsatisfactory condition in addition to riparian areas in poor condition (Brinson and others 1981). The results are existing riparian areas that are only remnants of the potential natural plant community, with surrounding watersheds that are unstable and require significant changes in management before objectives of proper functioning riparian communities can be met.

If managed properly, grazing within riparian communities and along streams is compatible with other resources (Chaney and others 1990; Grette 1990; May and Davis 1981; Platts 1990). The timing, numbers, and duration of livestock use are the key factors that must be set and monitored to assure proper livestock management in healthy and degraded riparian areas (Chaney and others 1990). But livestock, especially cattle, will spend a disproportionate amount of time in riparian areas compared to uplands (GAO 1988b; Clary and Webster 1989; Platts 1990).

Livestock grazing is not prominent in the Coastal analysis area. Less than 45 percent of the federal lands in the area are grazed, which is also less than 5 percent of the forage authorized for grazing by BLM and Forest Service nationwide. Many of the special status wildlife living in the area are unaffected by livestock grazing on federal lands and were not analyzed in detail for the Rangeland Reform EIS.

Often on federal lands in the Coastal analysis area, especially the southern portion, livestock graze near or in riparian communities. The Coastal analysis area has riverine, lacustrine, and estuarine riparian communities. Waterfowl, shorebirds, heron, osprey, bald eagle, swift, Santa Cruz long-toed salamander, deer, elk, mink, and other wildlife use riparian communities in the area.

## Riparian Conditions and Trends

Riparian habitats cover about 3.2 million acres of federal land in 11 western states. Though inventories of riparian communities are incomplete, a large amount of riparian habitat that has



been evaluated is known to be in a nonfunctioning condition. (See Table 3-7 and Figure 3-1.) Over the past decade, land management agencies have been concentrating restoration efforts on riparian areas, which respond quickly to management changes. As a result, riparian areas that were most obvious and visible to the public were inventoried and have generally received the most management attention. Many are recovering from past land use abuses.

Not shown in Table 3-7 are the extensive riparian areas that have been degraded to the point that they are no longer recognized as having riparian or wetland values or potential. Other obvious trends can also be noted from Table 3-7:

- Riparian communities at higher elevations that receive greater precipitation are more extensive and generally in better condition.
- Riparian resources at lower elevations, receiving less precipitation, and influenced extensively from upstream watersheds, are less extensive and generally more deteriorated. As the condition of riparian resources declines, accelerated erosion increases, incising stream channels. Water tables are lowered, resulting in historically wide floodplains being reduced to a narrow riparian community in the bottom of a wash (BLM 1993g). (See the description of grazing im-

pacts on riparian and aquatic communities in the "Wildlife" section.)

GAO (1988b) reported that federal lands managed by BLM and the Forest Service had degraded riparian communities, largely due to extensive overuse by livestock. Chaney and others (1990) reported significant improvements in rangeland condition. Improved upland conditions do not necessarily mean improved riparian habitat. In fact, extensive field observations in the late 1980's suggest that riparian areas in most of the West were in the worst condition in history (Chaney and others 1990). Platts (1990) stated that although uplands have recovered since 1935, the condition of riverine-riparian systems has continued to decline.

In the last few years, BLM and Forest Service have improved certain riparian communities (BLM 1992b). But most federal riparian acreage is not getting this special treatment. Once a riparian community has been or is being degraded and its banks and channels are unstable, excessive use by livestock will not allow the area's vegetation to recover. Riparian areas degraded by livestock will continue to degrade through accelerated erosion until grazing management is changed. Riparian areas will not recover on a large scale without changes in policy, regulations, and management (Elmore and Beschta 1987).

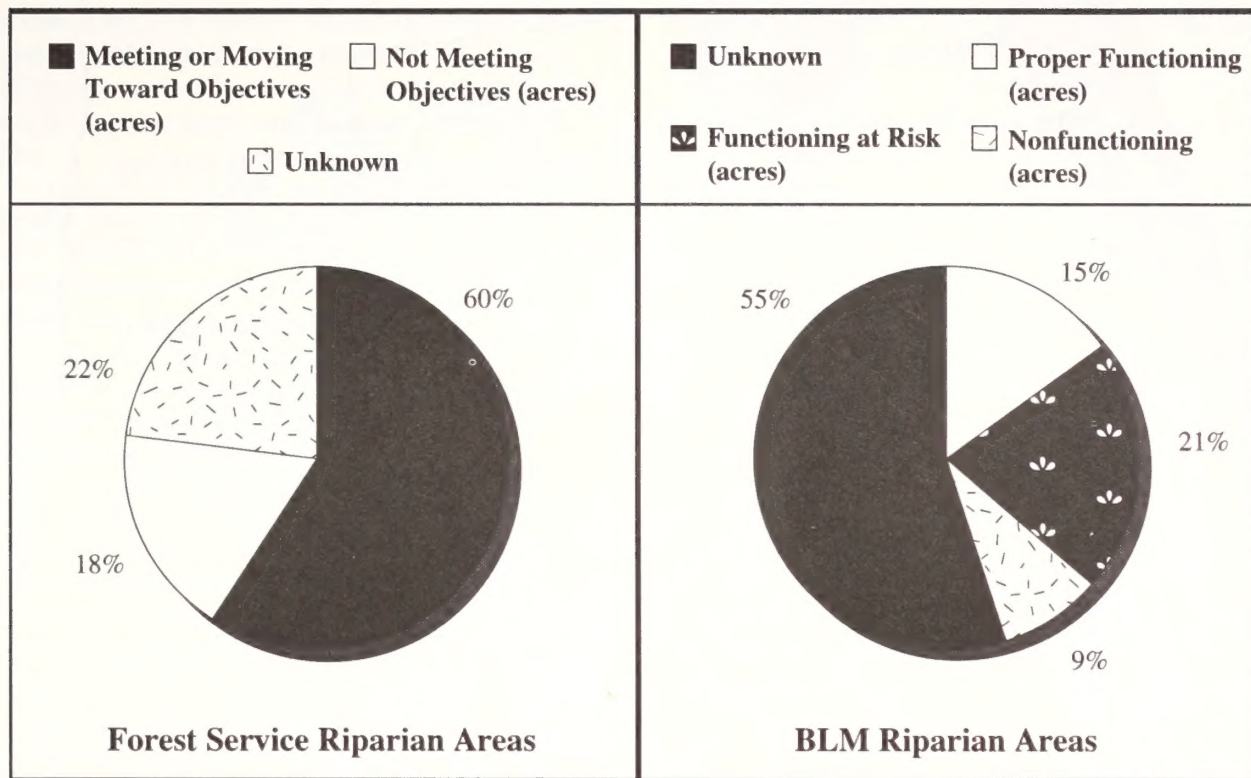
**Table 3-7: Current Condition of Riparian Areas by Agency**

	<b>Meeting or Moving Toward Objectives (acres)</b>	<b>Not Meeting Objectives (acres)</b>	<b>Unknown</b>	
USDA Forest Service	1,376,496	413,567	503,362	
% of FS riparian acres	60	18	22	
	<b>Proper Functioning (acres)</b>	<b>Functioning at Risk (acres)</b>	<b>Nonfunctioning (acres)</b>	<b>Unknown</b>
BLM	155,735	219,201	88,046	565,430
% of BLM riparian acres	15	21	9	55





**Figure 3-1: Current Condition — 1993**



## *Watersheds*

### **Upland Soils**

Soils in the study area are diverse, ranging from aridic soils high in sodium and soluble salts, to shallow, barren alpine soils, and deep, loamy soils of the Great Plains grasslands.

Soil development and formation are controlled by five soil-forming factors: (1) climate, in which temperature and precipitation are the most influential forces in the soil-forming process; (2) living organisms, particularly native vegetation, as well as animals and microorganisms; (3) nature of the parent material, including texture, structure, and chemical and mineralogical composition; (4) topographic location, which can quicken or delay the climatic factors; and (5) the length of time materials are subjected to weathering (Brady 1974). Each of the factors for forming soil have contributed to the formation of seven major soil orders on the western federal land (Map 3-4).

Alfisols are mineral soils that have developed in cool, moist regions, usually under a for-

est canopy. Having a significant accumulation of clay within the profile, they are common in the coniferous and deciduous forests at higher elevations and mountain shrub community in the coastal analysis area. Alfisols are generally productive soils that respond to changes in management.

Andisols are mineral soils with a strong volcanic ash influence. Andisols are principally found in forests. This is a new order within soil taxonomy. (See Map 3-4.) Many of the soils formally classified as Alfisols are now classified as Andisols. Andisols are productive, often erosive, and responsive to changes in management.

Aridisols are mineral soils that have developed in dry regions. They are light colored; low in organic matter; and may have accumulations of sodium, soluble salts, and lime. The vegetation types found on Aridisols are important contributors to the western livestock industry. Aridisols are common in the desert shrub, sagebrush, and pinyon juniper vegetation communities. Without irrigation Aridisols are not as productive as those that receive more precipitation and as such, they are slower to respond to changes in management.



# Map 3-4. Generalized Soils Map



- Alfisols
- Aridisols
- Entisols
- Histosols
- Inceptisols
- Mollisols
- Ultisols
- Vertisols
- Misc. (Salt Flats)

Source: U.S. Department of Agriculture, U.S. Soil Conservation Service, National Cooperative Soil Survey Classification of 1967 (Reviewed 1985). Soils National Atlas of the United States. (U.S. Government Printing Office, 1987.)



Entisols are mineral soils that lack profile development (soil horizons) and are often called young soils. Entisols are formed in recently deposited material. They are often found in lower elevation, arid and semiarid environments supporting desert shrub and sagebrush communities.

Inceptisols are mineral soils that have some profile development and have at least one horizon. They are also young soils but have experienced higher weathering and soil-forming processes than have Entisols. Common in the coniferous and deciduous forests, inceptisols are productive soils whenever they have adequate moisture and will respond well to changes in management.

Mollisols are mineral soils that have thick, dark-colored surface horizons rich in organic matter. They are fertile and extend from the higher mountains to the prairie grasslands where they are most abundant. Mollisol soils support the plains grassland, chaparral-mountain shrub, mountain and plateau grasslands, and coniferous-deciduous forest community types. Used extensively for livestock grazing, Mollisols are highly productive soils that respond well to management changes.

Ultisols are mineral soils associated with advanced soil development on stable geomorphic surfaces. Water moves sufficiently through Ultisols for removing bases and for forming accumulations of clay. Though normally low in bases, the soils usually support forest vegetation, which efficiently cycles and retains necessary nutrients. Ultisols mainly occur along the coastal mountain ranges of northern California and southern Oregon, and valleys between the Coast and Cascade mountains of western Oregon and Washington. Productive soils that respond well to changes in management, Ultisols are associated with Douglas-fir forests.

Soil erosion is influenced by climate, topography, soil properties, soil condition, cover, and land use. Cover is the main factor in controlling erosion. Sufficient cover requires adequate vegetation (basal cover and foliar cover) and natural litter. Cover intercepts precipitation, reducing raindrop impact, restricting overland flow, and allowing more infiltration and less runoff and erosion.

Natural litter is an important component of cover. Not only does litter provide the ben-

efits discussed above but also adds to the overall health of the soil by improving soil structure, thus improving the ability of the soil to absorb water. Litter also supplies nutrients to the soil.

Research has found that cover values of 30 to 40 percent are the lowest needed to control sheet and rill erosion and that 20 percent cover is needed to prevent wind erosion. The 30 to 40 percent minimum cover values are more pertinent to the arid regions, where cover is naturally sparse. Cover values of 85 percent are not uncommon in the plains grasslands.

Rangelands are affected by all three types of water erosion: sheet-rill, gully, and streambank. Sheet-rill erosion is insidious in being often unnoticed yet capable of reducing the productivity of rangeland soils. Conversely, gully and streambank erosion are far more noticeable. Many of the uplands, especially in more arid regions, have a gully network inscribed throughout, replacing what was once grass-covered swales. As a result, water flow patterns in arid areas have been altered, causing an increase in size and frequency of runoff events and sediment yield to local water sources. Some researchers have concluded that 75 percent of the erosion in desert systems is the result of gully and streambank erosion.

The affect of wind erosion on rangelands has not been sufficiently researched. Vegetation cover on most rangelands appear to be sufficient to keep wind erosion from becoming a problem. Most wind erosion problems result from bare soils, such as along trails or on disturbed surfaces.

## Riparian Soils

Soil formation in riparian areas differs from soil formation in uplands. In riparian areas, the basic building block of soil formation, mineralized sediment, is deposited from erosion of adjacent uplands, vertical deposition of stream sediment during overbank flooding, and lateral deposition of stream sediment from stream meander migration. The position of soils in relation to alluvial groundwater is one of the dominant factors controlling the rate, degree, and form of soil genesis (Platts and others 1987). These processes create complex soil patterns,



exhibiting differences in age, texture, and degree of formation over relatively small areas.

Riparian soils are important for supporting a productive vegetation community, allowing groundwater recharge during overbank flooding and forming stream channel banks.

Soil orders most common in riparian areas are Entisols, Mollisols, and Histisols. Histisols, not previously discussed, contain at least 50 percent organic matter in the upper 32 inches of their profile. Histisols occur most commonly within seep and boggy areas in the alpine zone.

## Riparian Hydrology

Riparian communities support several hydrological interactions that benefit the overall ecosystem. Vegetation overhanging streambanks helps regulate water temperature, indirectly maintaining dissolved oxygen levels needed for aquatic life. Dense vegetation and relatively level slopes slow runoff from uplands as it passes through the riparian zone, thereby allowing sediment to be deposited and groundwater to recharge. Similarly, natural floodplain obstructions, like vegetation, control overbank flooding. Being fed by alluvial groundwater, streams often remain perennial during dry seasons and extended droughts. In addition to overbank flooding and upland runoff, groundwater is recharged during high flows through channel banks.

Stream channels formed in alluvium depend on the adjacent riparian zone for their stability. Channels regulate the energy of flowing water by adjusting channel features, including width and depth, streambed slope, the degree of stream meandering, and the roughness of channel bed and banks. (Roughness is caused by features such as vegetation, bed materials, and gravel bars.) Streams functioning in a state of dynamic equilibrium, in which there is a balance between erosion and deposition, experience no net loss or gain in sediment load. As flow and sediment supply vary, channel features adjust in an attempt to achieve a new balance.

Riparian communities are degraded by on and off-site disturbances. Sensitive hydrologic interrelationships exist between the condition of uplands and their associated riparian com-

munities. Uplands in nonfunctioning condition often experience increased surface runoff, higher sediment yields, and increased erosion within stream channel systems (DeBano and Schmidt 1989). Direct disturbance, such as overgrazing, has increased erosion in some riparian communities.

Stream-riparian systems experiencing increases in runoff and sediment from upland disturbances or increased susceptibility to erosion from direct disturbances often cannot adjust their channel features to achieve equilibrium. If sediment increases beyond the stream's ability to carry it, channels tend to aggrade and form multiple interwoven braids. In another type of system, where channel erodability or streamflow is increased, with relatively low sediment production, channels will erode.

Streams with coarse-textured substrates and fine-textured banks tend to laterally erode, becoming shallower and wider, often creating braided conditions. Stream channels with fine-textured substrates, common at lower elevations, usually erode vertically, forming gullies.

Shallow and wide streams are sensitive to overgrazing because the stability of their banks depends on the type and vigor of the streamside vegetation. Such streams are considered hydrologically nonfunctioning because streamflow and sediment supply are not in balance and these streams have lost many beneficial riparian functions: overbank flooding, floodplain sediment deposition and soil forming processes, alluvial groundwater recharge, maintenance of water quality, and reduction of flood peaks.

When disturbance factors are removed, most riparian-stream systems begin a relatively rapid recovery toward properly functioning condition. Incised or laterally widened stream systems, however, with low sediment yields, with or without fluctuating flow patterns, do not recover so rapidly.

The main water quality issues associated with grazing practices on federal land in the study area are nonpoint-source pollutants; sediment, fecal coliform bacteria (used as an indicator for other fecal pathogens), nutrients, and salinity. The Clean Water Act influences both agencies' policy and responsibility for water quality standards and nonpoint-source water quality management (Van Haveren and others



1985). The national nonpoint-source strategy is to:

- Cooperate with and assist state agencies in the management of federal lands to reduce nonpoint-source pollution,
- Address water quality impacts, including nonpoint-sources, in land management actions planned and implemented, including best management practices (BMPs),
- List and address nonpoint-source water quality issues in plans,
- Provide people and resources to identify nonpoint-source pollution and develop control techniques through coordinated research and the implementing of best management practices, and
- Implement program practices in conducting land use and land management activities to avoid or reduce water quality impacts and to improve water quality as needed to meet management objectives and regulatory requirements.

Sediment, America's most widespread pollutant, is an important consideration in the control of other pollutants such as nutrients and salinity since sediment often transport of sediment often releases the pollutants into stream systems. Generally, the most significant impact of sediment is the effect of siltation on stream and riparian systems. Sediment on federal land is caused by upland (sheet and rill erosion) and channel erosion. Channel erosion is often accelerated where stock ponds and other water-related structures are improperly built or maintained. In watersheds with actively incising stream channels, channel erosion can be greater than upland erosion (Osborn and Simanton 1989). Lower elevation rangelands, where vegetation cover is limited, have the highest sediment production rates. Typically, sediment carried in surface water represents only a fraction of total erosion, which is determined by drainage size, shape and relief, topographic and chan-

nel characteristics, and characteristics of runoff and rain (Chow 1964).

Fecal bacteria populations in surface waters are known to increase with the presence of livestock. Factors controlling the severity of fecal bacteria pollution include number of livestock, closeness of grazing to surface water, and surface runoff conditions on areas being grazed. Excessive nutrient loading of surface waters from livestock results from similar factors as for bacteria.

BLM has several ongoing activity plans and coordinated resource management plans containing upland and riparian objectives, as directed by BLM's Riparian-Wetland Initiative. Commonly the objectives are to improve and protect riparian and upland areas to reduce accelerated (human-caused) sediment production. Most, if not all, of the state nonpoint source programs within the study area lack numeric sediment standards which may be used to evaluate BLM's level of compliance. But maintaining or improving nonpoint-source water quality by implementing management plans, does comply with the Antidegradation Policy (40 CFR 131). Implementing management plans could also result in compliance with nonpoint-source narrative criteria, which qualitatively describe limits for sedimentation impacts.

Activity plans and coordinated resource management plans implemented to improve nonfunctioning upland and riparian areas indirectly reduce the factors attributed to fecal bacteria and nutrient pollution of surface waters. Typical nonpoint-source water quality standards for fecal coliform bacteria are 200 colonies/100 ml and 2000 colonies/100ml for primary and secondary contact recreational waters, respectively. Colorado has a nutrient standard for nitrate-nitrogen of 10 mg/l for drinking water. The agencies, however, do not commonly monitor for compliance with numeric fecal coliform bacteria and nutrient standards on an allotment basis.

Federal lands in nonfunctioning condition and not being managed under an activity plan or coordinated resource management plan could be out of compliance with nonpoint-source programs. But monitoring data to support this conclusion are lacking.

BLM participates in a federal program directed by the Colorado River Basin Salinity Con-



trol Act (PL 98-569) to reduce salt loading in the Colorado River. Salt concentrations on federal land are highest in marine shale geologic settings, where annual precipitation averages less than 12 inches (BLM 1987a).

It has been estimated that federal land contributes 8 percent of the total salt load of the Upper Colorado River Basin from nonpoint-sources (BLM 1980a). Salinity from nonpoint-sources increases with sediment yield. Vegetation cover is the most important management variable influencing runoff and sediment yield (BLM 1987a). BLM in most of the Upper Colorado Basin states has active plans to reduce salinity contributions to the Colorado River using vegetation management.

## Wildlife

Federal land sustains an abundance and diversity of fish and wildlife. As population pressures further restrict wildlife habitats, the habitats on federal land are becoming increasingly important in maintaining a national fish and wildlife heritage and overall biological diversity. Across the West, federal land provides a permanent or seasonal home for more than 3,000 species of mammals, birds, reptiles, fish, and amphibians. All species (plant and animals including invertebrates); their genetic differences; and their habitats, communities, ecosystems; and landscapes make up an area's biological diversity.

## Upland

### Sagebrush

Typical wildlife of open sagebrush include the sage grouse, sage thrasher, sage sparrow, sagebrush lizard (all named for the type of vegetation), black-tailed jack rabbit, pygmy rabbit, Great Basin and chisel-toothed kangaroo rat, deer mouse, Columbian ground squirrel, Townsend ground squirrel, sagebrush vole, coyote, black-billed magpie, gray flycatcher, canyon wren, horned lark, burrowing owl, red-tailed hawk, ferruginous hawk, prairie falcon and several other raptors.

Reptiles in the sagebrush habitat include the common garter snake, western rattlesnake, west-

ern ground snake, western skink, and sagebrush lizard.

Pronghorn antelope commonly live in sagebrush habitats when the sagebrush is less than 24 inches tall, a variety of forbs and other forage occupy the stand, the stand has less than 50 percent cover, and other components, such as water, are present (Cooperrider and others 1986). Mule deer, golden eagles, prairie falcons, and in some areas, bighorn sheep and chukar partridge commonly live around sagebrush habitats on broken terrain, especially rimrock. California bighorn sheep, the rarest North American subspecies, inhabit the rocky canyon complexes of southeast Oregon and southwest Idaho. In areas with low precipitation and forage production, the sagebrush's thermal cover may be critical to deer and other wildlife survival (Molini 1990).

As an elevational ecotone, the sagebrush habitat is important to mule deer, elk, mountain lions, bobcats, coyotes, bald and golden eagles, ravens, large predators, scavengers, and other wildlife. Sagebrush, often with scattered juniper and pinyon, commonly grows below deep layers of snow, making it suitable for wildlife winter rangelands along western mountain slopes. Most western winter rangelands critical to wildlife survival have plenty of sagebrush. Though most sagebrush and junipers are low-quality forage, they are usually associated with high-quality browse, such as bitterbrush, mountain mahogany, and cliffrose.

## Desert Shrub

A host of animals live in hot deserts, whose vegetation can support favorable populations of mule deer, kit fox, spotted skunk, Merriam's kangaroo rat, rock squirrel, Harris' antelope ground squirrel, southern grasshopper mouse, Harris' hawk, prairie falcon, common raven, Gambel quail, mourning, white-winged, and common ground doves, elf owl, Bendire's thrasher, curve-billed thrasher, phainopepla, Lucy's warbler, Canyon towhee, black-throated sparrow, desert tortoise, sidewinders and other rattlesnakes, side-blotched lizard, desert spiny lizard, desert iguana, chuckwalla, Gila monster, and several other lizards (Shelford 1963).

Hot desert vegetation occupies the habitats of most desert bighorn sheep, including sheep being reestablished. BLM and the Forest Service



manage roughly 80 percent of the remaining desert bighorn habitat. Desert bighorn populations have been expanded dramatically in recent years through transplants and habitat and water developments.

## Southwest Shrubsteppe

Historically, southwest shrubsteppe communities consisted of hot, arid, desert grasslands with small shrub components, growing mostly in southeast Arizona and southern New Mexico. But past uses resulted in these communities being invaded by brush that fragmented the grassland and reduced populations and distribution of wildlife. Animals such as the aplomado falcon, wolf, grizzly bear, and black-footed ferret have been replaced by animals that prefer brushlands. Examples of the replacement process created by vegetation change include the reduction in pronghorn antelope and Coues' whitetail deer and increase in mule deer and javelina. Over the past 10 years, the grasslands in parts of New Mexico rebounded when management and weather improved.

Wildlife typical of the southwest shrubsteppe include the bannertail kangaroo rat, black-tailed jackrabbit, badger, white-throated wood rat, pronghorn antelope, black-tailed prairie dog, Coues' white-tailed deer (in the western portion at higher elevations), scaled quail, Gambel's quail, Swainson's and ferruginous hawks, lesser nighthawk, Chihuahuan raven, verdin, cactus wren, pyrrhuloxia, McCown's longspur, green toad, southern prairie lizard, round-tailed horned lizard, desert grassland whiptail, western hooknosed snake, Mexican black-headed snake, and massasauga. Desert bighorn sheep have been re-established into some historic habitats in this type. In New Mexico, the southwest shrubsteppe supports the exotic oryx and ibex in some areas.

The southwest shrubsteppe often supports excellent upland game and raptor populations. When not in proper functioning condition, this type can be less valuable for Montezuma and scaled quail and will favor some raptors over species that have adapted to grasslands.

## Chaparral-Mountain Shrub

The chaparral-mountain shrub is the study areas's most widely scattered vegetation com-

munity. Because it is a mid-elevation montane vegetation type, many species of wildlife may seasonally descend or ascend to the community during winter or summer. Openings in this type can result in abundant herbaceous and shrubby forage for several years. But excessive use can reduce desirable herbaceous and browse species, increase unpalatable shrubs, leave less ground cover in usually steep areas, and subject areas to greater erosion. Such areas may be classified as nonfunctioning or functioning but susceptible to degradation.

The chaparral-mountain shrub community has diverse populations of wildlife, especially big game. Widespread in this community are large mammals such as mule deer, coyote, mountain lion, bobcat, and gray fox. White-tailed deer and collared peccary live in southern parts of this community type. Black-tailed jackrabbits and striped and spotted skunks also occur. Adapted to thick cover in the chaparral-mountain shrub community, the ringtail cat hunts for smaller mammals such as white-footed and brush mice. The wood rat is one of the most characteristic animals in these communities.

Birds are numerous throughout the year; more than 50 resident species have been identified in the scrub oak type in Utah. Distinctive birds in the chaparral-mountain shrub type include the rufous-sided towhee and black-chinned sparrow. Other birds include the black-throated gray warbler, scrub jay, Bewick's wren, plain titmouse, acorn woodpecker, and saw-whet owl.

Reptiles that feed on insects, bird eggs, nestlings, and small mammals include the gopher snake, western patch-nosed snake, night snake, eastern fence lizard, short-horned lizard, and Gilbert's skink.

## Pinyon-Juniper

Pinyon-juniper communities often produce good big game populations. Typical wildlife include mule deer, elk, desert kangaroo rat, pinyon mouse, bobcat, mountain lion, red-tailed hawk, golden eagles, wintering bald eagles, wild turkey, ash-throated flycatchers, western wood peewees, scrub jays, and plain titmice. Similar to reptiles in adjacent desert and forest communities, the reptiles of this type include the striped whip snake, California king snake, short-horned lizard, eastern fence lizard, collared lizard, Arizona black rattlesnake, and western patch-nosed snake.



The evergreen oak-alligator juniper vegetation community in southeast Arizona has the following animals associated with it, coati, ring-tail cat, black bear, Coues' white-tailed deer, Montezuma quail, band-tailed pigeon, whiskered screech-owl, white-eared hummingbird, Strickland's woodpecker, gray-breasted jay, bridled titmouse, black-chinned sparrow, giant spotted whiptail, ringneck snake, and black-tailed rattlesnake.

## Mountain and Plateau Grasslands

In the past, shrubs were insignificant to the mountain and plateau grasslands because cool-season bunchgrasses covered broad areas. Today, poor management practices have increased the dominance of such shrubs as sagebrush, saltbush, rabbitbrush, and bitterbrush (Shelford 1963).

The mountain and plateau grasslands offer habitat for a large variety of wildlife. Pronghorn antelope are residents, and mule deer and elk are winter visitors. Where grasslands adjoin sagebrush communities, common animals include the black-tailed jackrabbit, pygmy cottontail, and mice. At low to medium elevations, badgers are present as well as subspecies of ground squirrels. The pocket gopher is well distributed in these communities. Predators include the bobcat, mountain lion, and coyote. Common birds include the scrub, pinyon, and Stellar's jays; Clark's nutcracker; rock and canyon wrens; and dark-eyed junco. Marsh hawks, American kestrels, and golden eagles are common raptors. Reptiles include the lesser earless and collared lizards, the western terrestrial garter snake, and the pine gopher snake.

## Plains Grasslands

The plains grasslands, mixed and short, support a unique group of animals. Many grassland animals are burrowers and others are swift runners. Most burrowers and swift runners have keen eyesight and are quite gregarious, forming large herds or enormous colonies (Shelford 1963).

Huge herds of American bison once migrated with the seasons across the central plains. Now the pronghorn antelope is probably the most common large mammal, but mule deer and white-tailed deer are often abundant near brush,

such as along stream. Burrowing rodents include ground squirrels, prairie dogs, pocket gophers, and pocket mice. Burrowing predators include the badger, kit fox, and the spotted skunk. The white-tailed jackrabbit occupies the northern part of the ecosystem, and the black-tailed jackrabbit occupies the southern part. The desert cottontail is widespread.

Birds in the plains grasslands include horned lark, killdeer, western meadowlark, sharp-tailed grouse, and burrowing owl. Reptiles include the western hognose snake, great plains skink, and plains garter snake. Amphibians of the region include the plains spadefoot, great plains toad, and western box turtle.

In the plains, most major waterways and their associated riparian areas have a west-to-east orientation. The typical vegetation of the plains riparian areas consists of cottonwood and the cottonwood-willow communities. Riparian corridors are travel routes for wildlife moving westward and for the mountain species moving eastward. White-tailed deer, raccoon, opossum, and many birds migrate west along the riparian areas. Grizzly bear and bighorn sheep migrate east onto the plains along the riparian corridors, breaks, and canyons.

The plains grasslands consist mostly of short-grass prairie, mixed grass prairie, and sandhills prairie. The short-grass community is dominated by blue grama and buffalo grass. Historically, the short grass prairie evolved with a diverse community of grazing mammals, including ground squirrels, prairie dogs, elk, pronghorn and bison. Free-ranging herds of elk and bison are mostly gone, and the prairie dog ecosystem has been largely reduced and fragmented. The gray wolf has been replaced by the coyote, and the swift fox is on several state threatened and endangered lists.

Density and variety of birds in this area are relatively low (Bock and others 1993), with most species migrating to the region during the spring and summer breeding season. Birds remaining during winter are generally limited to the sharp-tailed grouse, horned lark, a few raptor species, and a handful of other species.

Mule deer and white-tailed deer are now common along wooded draws and riparian areas and in areas of broken topography. Recovery of deer populations can largely be attributed to state harvest and management regulations and beneficial farming practices.



Reptiles and amphibians of the plains grasslands include the bull snake, rattlesnake, great plains toad, and western box turtle.

The mixed grass prairie occupies an ecotone between the short-grass prairie to the west and true tall-grass prairie to the east. This region takes on the plant and animal characteristics of the drier shortgrass prairie or moister tall grass prairie, depending on land use practices and physical site characteristics (Bock and others 1993).

Where livestock grazing strategies and site characteristics favor taller grasses like western wheatgrass and green needlegrass, species like the prairie vole, short-eared owl, and greater prairie chicken are more abundant. Significant numbers of upland nesting waterfowl such as the mallard, gadwall, and shoveler are also found where upland cover levels near reservoirs and small impoundments allow for nest concealment and successful nesting. Where land use management and site characteristics favor vegetation of the short-grass prairie, prairie dogs, burrowing owls, and mountain plover benefit.

Nebraska's sandhills prairie, though once a great desert of sifting sand, is now a great sea of grass. When livestock grazing levels are conservative, such tall grasses as sand bluestem, switchgrass, and prairie sandreed thrive, as do scattered thickets of American plum, western chokecherry, and snowberry. The sandhills fauna is similar to that of the mixed grass prairie. In most of the sandhills, the greater prairie chicken and plains sharp-tailed grouse habitats overlap. The greater prairie chicken, plains sharp-tailed grouse, horned lark, and some raptors make up the only avian winter residents of the region. Common predators in the area include coyote, striped skunk, bullsnake, and several raptor species. Western box turtles and earless lizards abound. The scattered shrub thickets attract many of the avian species more common to the eastern forests, including brown thrashers, loggerhead shrikes, and red-headed woodpeckers.

Many burrowing rodents, especially ground squirrels and prairie dogs, require moderate to heavily grazed grasslands where visibility is relatively unrestricted. Heavy, dense, grass/forb vegetation hinders their ability to avoid ground and avian predators. Historically, the bison probably played a significant role in keeping parts of the plains grassland ecosystem open and more suitable for burrowing rodents. This function has now been replaced by livestock grazing.

Livestock grazing helps maintain prairie dog complexes and tends to promote conditions suitable for black-footed ferrets, an endangered species. Where livestock are managed at suitable levels, they maintain the open, high-visibility characteristic needed by prairie dogs and therefore by black-footed ferrets.

## Annual Grasslands

Livestock grazing favors the development of low-growing early spring maturing forbs and summer annuals. Without grazing, annual grassland are often dominated by dense stands of grasses such as ripgut brome and wild oats.

Loss of most of California's annual grassland to agriculture and development makes the remaining portions of federal land important for maintaining wildlife habitat. The agencies are actively conserving California's annual grasslands whenever possible.

## Alpine Grasslands

Wildlife of the alpine grasslands include the pika, pocket gopher, and yellow-bellied marmot, all permanent residents. Summer visitors include mule deer, elk, mountain sheep, weasels, marten, chipmunks, and the golden mantle ground squirrel. Nesting birds using the alpine zone include the horned lark, warwe pipit, black rosy finch, rock wren, robin, and white-tailed ptarmigan.

## Coniferous and Deciduous Forests

Each type of coniferous forest depends on a certain combination of climate regimes and soil development of its area. Important forests include the ponderosa pine, Douglas-fir, and fir-spruce forests. Mule deer live in coniferous and deciduous forests, preferring rough terrain for cover and shrubs for food. Elk graze in high mountain meadows during the summer and shrublands in the winter. Other animals common in western forests are the northern flying squirrel, golden mantled ground squirrel, and red squirrel, which prefers spruce-fir forests and is found in the Rocky Mountains. Porcupines are the largest rodent in western forests.

Resident birds in this region include the pygmy nuthatch, Stellar's jay, sharp-shinned hawk, red-breasted nuthatch, mountain chicka-



dee, Cassin's finch, northern flicker, dark-eyed junco, western goshawk, red-tailed hawk, and great-horned owl. Birds that are common during the summer include the western bluebird, yellow-rumped warbler, yellow-bellied sapsucker, western flycatcher, and western tanager. The spruce grouse inhabits the higher elevation spruce and fir forests, the blue grouse uses mid and lower elevation forests, and the ruffed grouse is most common in riparian areas.

Common reptiles include the wandering garter snake, pine gopher snake, and western rattlesnakes. The most common amphibians include the Rocky Mountain toad and the common leopard frog of the Rocky Mountain states (Dickerson 1969).

The deciduous forest portion of the analysis region consists mainly of aspen forest and parkland. Aspen, one of the most widespread plants in the world, is important wildlife habitat. Aspen groves are commonly associated with coniferous forest and mountain meadows and grasslands. Aspen typically make the edges of forests more diverse and increase habitat diversity. Aspen stands also tend to have more ground cover than coniferous forests. Aspen leaves and new growth shoots are also palatable to big game.

## Riparian, Wetland, and Aquatic Communities

Perhaps the most significant wildlife habitats on federal land are the riparian habitats. Undisturbed riparian ecosystems normally provide abundant food, cover, and water, and often contain some special ecological features or combination of features that are not often found in upland areas. Consequently, riparian ecosystems are extremely productive, and have diverse habitat values for fish and wildlife. The importance of riparian ecosystems can be attributed to biological and physical features, including the following:

- Predominance of woody plant communities;
- Presence of surface water and abundant soil moisture;
- Closeness of diverse structural features (live and dead vegetation, water bodies,

nonvegetated substrates), resulting in extensive edge and structurally heterogeneous wildlife habitats and,

- Distribution in long corridors that provide protective pathways for migrations and movements between habitats (Brinson and others 1981).

Riparian areas are also extremely significant to bird populations (Bull and Skoulin 1982). Of the 148 species of breeding birds in the Great Basin, only 17 (11 percent) do not use riparian areas (Ohmart and Anderson 1982). Eighty-two percent of breeding birds in northern Colorado optionally survive in riparian areas, and 51 percent of all birds in the southwest states depend on riparian areas (Knopf and others 1988). Riparian areas also attract a disproportionate number of migrating birds and are primary habitat for waterfowl and shorebirds. Riparian areas or wet meadows are critical to the rearing of sage grouse broods (Call 1974). Riparian areas with large deciduous trees, such as cottonwoods, are the most significant for most nongame birds and raptors. The trees' variety and densities increase significantly in multilayered riparian systems (Cooperidder and others 1986).

Other vertebrates also depend on riparian areas (Knopf and others 1988; Medin and Clary 1989; Kauffman and others 1982). Riparian areas are also significant to big game. Pronghorn antelope use them extensively in summer (Cooperidder and others 1986). Mule deer and elk also use riparian areas extensively for food and cover and for travel and migration corridors (Thomas and others 1979). Riparian areas in desert ecosystems also provide significant wildlife habitat as has been demonstrated by the presence of many desert wildlife, from mule deer (Krausman and others 1985) through the avian species (Johnson and Haight 1985).

Several studies have reported the harmful effects of cattle grazing on riparian vegetation, and recovery of vegetation when grazing is modified, reduced, or eliminated (Ames 1977; Knopf and Cannon 1982; Richard and Cushion 1982; Taylor 1986; Winegar 1977). The quality of fisheries has a direct correlation to the health of the riparian community (American Fisheries Society 1980; Platts 1982, 1990; Swanson 1989), and the best opportunity for improving fisheries productivity is to restore riparian habitats degraded by livestock grazing (Platts 1991).



Aquatic habitats are diverse and inhabited by many resident fish, including native and introduced species. Many waters are also inhabited by exotic species introduced for their sport fishing value. With the exception of certain examples and special status species, fisheries will be discussed only generically.

Assessments of riparian communities find that a significant portion are in less than proper functioning condition or not meeting forest plan objectives. Although aquatic inventories are incomplete, aquatic and riparian habitats are known to be degraded by livestock grazing. In the West, livestock grazing is the main use that degrades the condition of aquatic and riparian communities. Other activities, such as mining, timber harvesting, urbanization, recreation, or vegetation treatments, have caused less deterioration of riparian communities than livestock grazing.

In addition, nonnative (exotic) fish are aggressive competitors. When introduced to new habitats, they often prey on native fish or outcompete native fish for food and habitat. They have displaced or eliminated native fish or caused native fish populations to decline. Introduced fish include rainbow, eastern brook, golden, and German brown trout and Arctic grayling in cold water habitats. Fish that have been introduced in warm water habitats include carp, catfish, bullheads, small and largemouth bass, walleye, northern pike, white crappie, yellow perch, sunfish, and minnows.

## Resident Fisheries

The following resources are habitats of resident fish on federal land within the scope of this EIS:

111,947 miles of streams;  
771,573 acres of reservoirs; and  
316,273 acres of lakes.

Resident fisheries include two basic types: cold water and warm water.

## Cold Water Resident Fisheries

In cold water habitats, streams have low water temperatures; definite channel gradients; sand, gravel or rock substrate; strong currents; high oxygen content; low nutrient values; and

no rooted aquatic vegetation (Smith 1966). The classification is less definite for lakes: generally the water temperature remains cold year-round (below 60 degrees F), nutrient values are low, and aquatic plants are not abundant (BLM 1986). Typical fish in cold water habitats include the native cutthroat trout; native suckers and minnows; and widely introduced rainbow, brook, and brown trout.

## Warm Water Resident Fisheries

Warm water aquatic habitats have higher water temperatures, gentle channel gradients, soft bottom materials, slow currents, lower oxygen content, high nutrient values, and substantial rooted aquatic vegetation. Lakes often have similar characteristics, fewer channel features, and at least one warm season exceeding the water temperature limits of cold water fish (Smith 1966). Warm water fish include the bluegill, largemouth bass, crappie, catfish, squawfish, pupfish, and the exotic Asian carp (Cooperrider and others 1986). Warm water resident fisheries are mainly located at lower elevations in the southern part of the study area.

Invertebrates are known to be biologically diverse and productive on federal land because of the variety of accessible habitats. But more information is needed about them, including those that also live in aquatic habitats. Invertebrates will not be discussed in detail in this EIS.

If managed properly, grazing within riparian communities and along streams is compatible with other resources (Chaney and others 1990; Grette 1990; Platts 1990; May and Davis 1981). The timing, numbers, and duration of livestock use are the key factors that must be set and monitored to assure proper livestock management in healthy and degraded riparian areas (Chaney and others 1990).

The timing, number, and duration of livestock grazing, however, are not universally the same for every location. What works in Idaho may cause severe damage in the deserts of New Mexico or Arizona. Livestock, especially cattle, will spend a disproportionate amount of time in riparian areas compared to their use of uplands (GAO 1988; Clary and Webster 1989; Platts 1990).

Managers must consider many physical characteristics specific to each site in selecting the correct grazing prescription. If light, grazing



can be used as a management tool to maintain most riparian areas in a highly productive state. But in some areas grazing may not be compatible with existing resources. In most cases, light use of a proper functioning riparian community will probably result in more forage consumed by livestock than would be consumed from deteriorated riparian areas under heavy use.

Livestock operators are among those that benefit most from healthy riparian communities. They experience less flood damage, sediment deposition, and erosion of meadows and hay fields. They can depend on late-season water source for livestock watering and hay field irrigation, and if not overused, an abundance of high quality forage.

Riparian communities in good condition are fragile and complex. They act like a huge sponge or natural reservoir in times of water abundance, then, through capillary action, slowly release stored water during dry periods of the year (BLM 1989). This results in moderated stream flow yearlong for perennial streams or extended periods of flow for intermittent streams (Heede 1977; Brinson and others 1981, Winegar 1977). In some cases, restored riparian habitats will reestablish perennial flow in streams that are intermittent in a deteriorated condition.

A healthy riparian community protects streambanks from erosion and maintains a high water table and productive habitat for fish and aquatic invertebrates. Overhanging vegetation protects water from direct solar heating and covers fish while they hide and rest (BLM 1989). Healthy riparian communities also provides habitats for hundreds of terrestrial species, significantly contributing to the biological diversity and quality of the ecosystem (Thomas and others 1979).

Excessive livestock grazing affects many resources watersheds, but no community is more susceptible to degradation than those associated with aquatic resources. Beginning at the headwaters, livestock severely trample source springs and destroy protective riparian vegetation and reducing spring outflow. Without shade from riparian vegetation, solar radiation rapidly increases water temperatures (F&WS and NMFS 1981).

Downstream, livestock heavily concentrate in the riparian zone removing protective vegetation. Trampling results in soil disturbance, particularly in wet meadows and stream chan-

nels. Erosion of the stream channel is accelerated, eventually resulting in a lowered water table, reduced water storage capabilities of streambanks and floodplains, and altered streamflow morphology (F&WS and NMFS 1981; Winegar 1977).

Altered streamflow morphology typically increases frequency and intensity of flooding (no retention of precipitation) and reduced late summer flow or loss of perennial flow when water is needed most. Increased runoff or frequent flooding further increases erosion, resulting in widened and straightened stream channels, which allows increased water velocity during flow periods and increased exposure of the water to sunlight. During low flow periods living space for fish is significantly reduced and water temperature elevates rapidly due to increased exposure to solar radiation. In addition, water for use in irrigation and watering of livestock is reduced.

As erosion progresses and water tables lower, natural grass meadows are left high and dry. Once meadow grasses die, brush species, such as sagebrush and rabbitbrush, immediately encroach and reduce the amount and quality of forage (BLM 1993g). Figure 3-2 shows the sequential degrading of a stream channel and its associated riparian community (wet meadow). As riparian resources degrade, accelerated erosion incises stream channels, lowering water tables and restricting historically wide floodplains to narrow riparian communities in wash bottoms. Figure 3-3 shows recovery of stream-associated riparian areas.

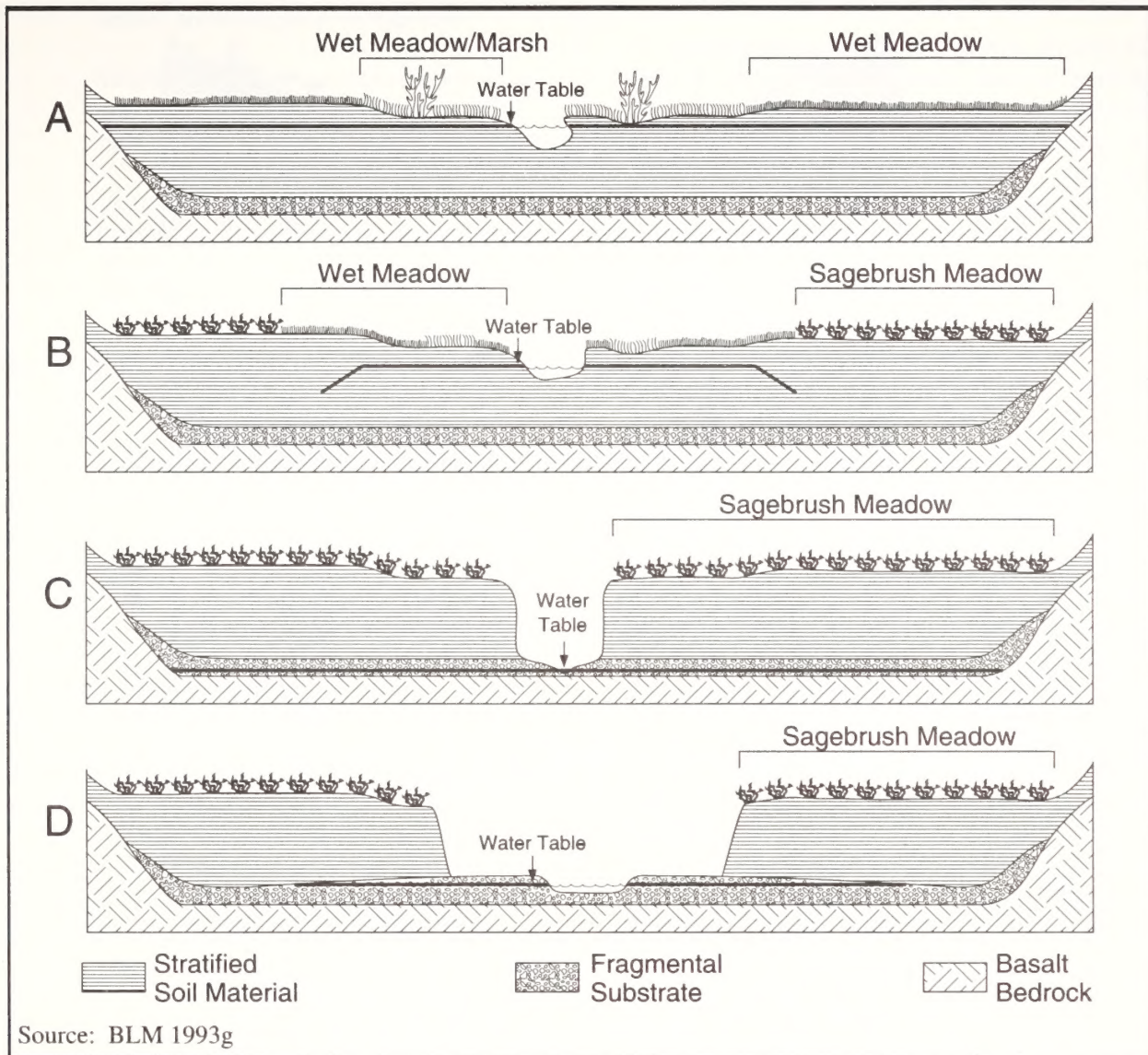
Heavy livestock grazing most severely affects the stream channel. Livestock tend to spend a large portion of their time within the riparian community because of the lush vegetation and shade. As a result, livestock consume a greater percentage of riparian vegetation than they consume on surrounding uplands. While grazing, livestock trample riparian vegetation and streambanks. Eventually protective riparian vegetation is lost. Streambanks are sheared off through trampling and become erodible (Bowser and others 1979).

Once streambanks are broken down and eroded, streams are left wide and shallow with significantly less living space or hiding cover for fish. Wide streams have huge surface areas exposed and susceptible to increased water temperatures and rapid evaporation (Brown and Krygler 1967; Crispin 1981). Eroding





**Figure 3-2: Sequential Degrading of Stream Channel**



streambanks contribute excessive sand and silt accumulation over the stream bottom, decreasing aquatic invertebrates (fish food) production and smothering fish eggs in spawning areas (Armour 1978).

The most significant results of excessive livestock grazing in riparian areas are as follows:

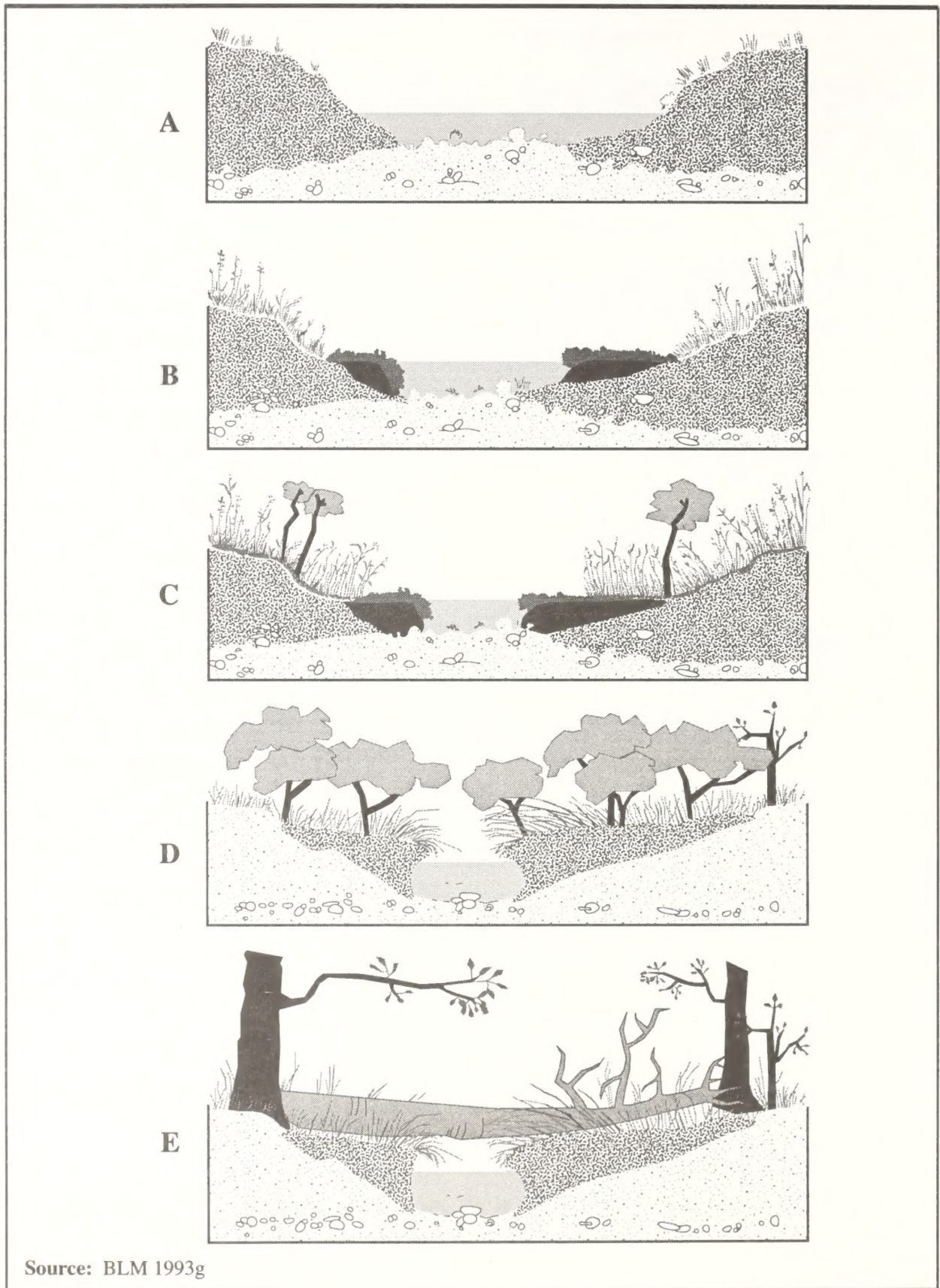
- Fish, particularly salmonids, are reduced in numbers, size, and distribution, with populations eventually being eliminated.

- Water quality degrades from increased turbidity and chemicals (livestock pollutants) leaching through soils.
- Less or no water is stored within banks, causing flood damage and reduced late season flows of springs and streams.
- Less water exists for livestock, wildlife, farmers, and recreationists during dry periods, when water is in greatest demand.





**Figure 3-3: Recovery of Stream-Associated Riparian Area**



3-46



- Recreational resources such as game, fish, watchable wildlife, and aesthetic values are reduced or eliminated.
- Wildlife habitats are lost as vegetation and water quality degrade or are eliminated.
- Vegetation changes from desirable grasses to less desirable, unpalatable shrubs, reducing the amount of forage for livestock.

## Nongame Wildlife

For purposes of this analysis, the expression nongame wildlife refers to a myriad of species that are not encompassed under the other topical wildlife categories of big game, upland game, waterfowl, raptors, threatened and endangered species, and anadromous and resident fish. To facilitate the analysis however, nongame wildlife as considered herein will be referenced as a single entity, except as otherwise noted in specific narratives. Some nongame wildlife referenced here may or may not be protected by state or federal laws that regulate their being taken for sport or other purposes.

The impact analysis for nongame wildlife does not include animals designated under the Endangered Species Act as threatened or endangered, those proposed for listing as threatened or endangered, and those listed as candidate species. The impact analysis also does not consider species that BLM and the Forest Service refer to as sensitive. (See the "Special Status Species" in the following major section of Chapter 3.) Though sensitive species are not considered in the impact analysis, impacts to nongame wildlife resulting from the Proposed Action and alternatives could indirectly harm or benefit them. Nongame wildlife include the following groups of animals:

- Neotropical migratory birds
- Yearlong resident passerine birds
- Predatory animals
  - (including those protected by law)
- Furbearers
- Bats
- Rabbits and hares
- Large and small rodents

- Herptiles (reptiles and amphibians)
- Terrestrial arthropods (insects and spiders)

Representatives of each group inhabit all upland and riparian habitats. Species inhabiting riparian habitats are expected to respond faster than species inhabiting upland areas because vegetation (habitat condition) in riparian areas would respond faster to management actions than would upland vegetation. Because of a major national initiative on their welfare, neotropical migratory birds are discussed in greater detail in the following section.

## Neotropical Migratory Birds

In recent years, public concern has been aroused by declining populations of birds that breed in the U.S. and Canada and migrate to Mexico, the Caribbean islands, and Central and South America to winter. Almost half of the birds that breed in the U.S. and Canada fall within this group, collectively referred to as neotropical migratory birds. Western federal land makes up an important portion of their breeding habitat. On BLM-administered lands alone, more than 170 birds have been documented. Riparian areas are especially vital, but all habitats on federal lands are important to neotropical migrants. BLM and Forest Service are major partners in the Neotropical Migratory Bird Conservation Program, begun in 1990.

At the National Workshop on Status and Management of Neotropical Migratory Birds, Bock and others (1993) presented a paper summarizing the known effects of livestock grazing on these birds in western North America. They described livestock grazing as a widespread and important influence in four major ecosystems in western North America: grasslands of the Great Plains and Southwest, riparian woodlands, intermountain shrubsteppe, and open coniferous forests. They noted that "herbivory by native hooved animals has been an important, natural, ecological and evolutionary force in certain non-forested ecosystems" but added that "domestic livestock have increased the influence of grazing in most systems historically, and this influence has been particularly destructive to ecosystems where native grazing ungulates were scarce or absent." They further described riparian woodlands as centers of high diversity and abundance of neotropical migratory birds and



many of these birds responding negatively to livestock grazing.

More research is needed on the effects of livestock grazing on neotropical migrants and their habitats. Nevertheless, since neotropical migratory bird populations are declining and some effects of livestock grazing on their habitat are understood, the following management recommendations were prescribed for the four ecosystems:

### *Grasslands*

1. Substantially increase the amount of federal rangeland from which all livestock are permanently excluded.
2. Continue a modified version of the Federal Conservation Reserve Program to encourage landowners to convert and maintain formerly tilled croplands as grassland planted to native vegetation.

### *Riparian*

1. Consider the condition of riparian areas when implementing grazing systems, and, when practical, manage riparian woodlands separately from adjacent uplands.
2. When riparian systems are grazed, moderate use during late fall and winter, or short-term use in spring, will be less damaging than continuous or growing season grazing. (This statement does not imply that moderate grazing causes no damage.)
3. Degraded riparian habitats may require complete rest from livestock grazing to initiate the recovery process.
4. Given their scarcity, fragility, and importance to neotropical migrants and other wildlife, western riparian ecosystems should be excluded from livestock grazing wherever possible.

### *Shrubsteppe*

1. There is an urgent need for protection, restoration, and long-term study of shrubsteppe ecosystems (including birds) dominated by native perennial grasses,

cryptogams, and moderate densities of shrubs, since shrubsteppe ecosystems probably existed before livestock were introduced.

### *Coniferous Forests*

1. More research and studies are needed during both nesting and migration seasons, especially where comparisons are possible between replicated forested stands with known differences in grazing regimes or grazing histories.

## *Special Status Species*

This EIS considers the general state of special status species, since more detailed analyses will be done during the development of regional plans. Specific examples are given to demonstrate the current environmental conditions for special status species affected by livestock grazing.

Species that are considered special status species in this EIS include those that are listed by the state or federal agencies as endangered, threatened, candidate, sensitive, of special concern, and any other group that has been formally designated as a management concern. The Forest Service defines sensitive species as state-listed, federal candidates, and other nonfederal-listed species that require special attention. (Federal candidate and state threatened and endangered species include other species in addition to those on the federal threatened and endangered species list.) BLM and Forest Service have policies, involving high-priority cooperative habitat management, to prevent sensitive species from being federally listed as threatened or endangered and ensure their restoration.

One common goal for the BLM and Forest Service is to avoid making the protection of one special status species a priority in land use management. Thus, they would avoid placing their efforts and funds on symptoms rather than on underlying causes. The agencies would prefer to manage complete communities or ecosystems supporting native plants and animals, several of which may have special status (West 1993). The agencies know that as human activities that harm ecosystems increase, more species inevitably will be lost (Holdgate 1991). Consequently, special



status species, as well as their habitats, must be acknowledged.

The effects of livestock grazing on plant and animal communities depends on the nature of the affected plant or animal, grazing intensity, the seral history of the site, and long-term weather patterns (Milchunas and others 1988). Current ecological conditions can be linked to many individual resource conditions that have caused in endangerment to many species, groups of species, and sometimes everything within ecosystems. Also, management practices such as the use of fire, seeding of exotic plant species, or the use of chemicals or pesticides, can harm special status species. For a complete list of special status animals and plants as of September 1993, see Appendix F.

Many species and their habitats have been affected by livestock grazing, which in some cases has contributed to or caused the extinction or endangerment of species. For example, in a 1992 report, the General Accounting Office (GAO 1991b) cited several studies about the harm livestock grazing can cause certain wildlife species and their habitats. Concluding that current grazing practices degrade lands, the report discussed the tendency for livestock to transmit diseases to wildlife, destroy habitat, and change the composition of vegetation communities beyond what is practical for wildlife adaptation. The report outlined the impacts on several animals in the hot deserts, including the threatened Mojave desert tortoise, candidate bighorn sheep, endangered Sonoran pronghorn, and Mearns' quail.

Grazing directly and indirectly impacts special status species. Direct grazing impacts include livestock consumption of palatable special status plants and trampling special status species. Also, any actions related to grazing operations, such as road killing special status species or harming species by building water improvements, constitute a direct take. Direct impacts to special status species are often readily distinguishable. The extent of direct takes of listed species is not well known since monitoring is inadequate.

Livestock grazing may also indirectly impact special status species. Examples of indirect impacts include altering plant communities by removing palatable species, introducing exotic plants, and losing aquatic habitats that special status species depend on. Changes in plant communities as caused by grazing are serious harm-

ful effects to the overall ecosystem, which special status species depend on. Overgrazing slowly causes a decline in the diversity and abundance of native plants. Shifts in the abundance of plant communities favor or harm particular species.

Ecological decline from overgrazing is a gradual, long-term process. These effects are often hard to discern over time without exact measurement and tracking. As native plants die, they are usually replaced by exotic plants; inherently decreasing forage, watershed protection, and wildlife habitats.

Another example of indirect impacts on special status species is the increase of cowbird populations associated with livestock. Cowbirds place their eggs in the nests of other birds and let them raise their orphaned young. Unnaturally increased numbers of cowbirds can reduce the nesting success of special status bird species. These impacts to ecosystems have caused many species to decline, which in some cases have been so severe that species have become endangered or threatened.

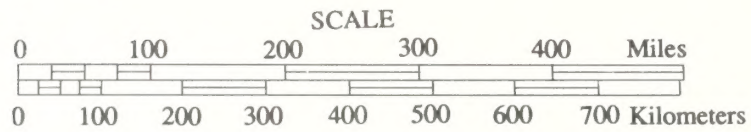
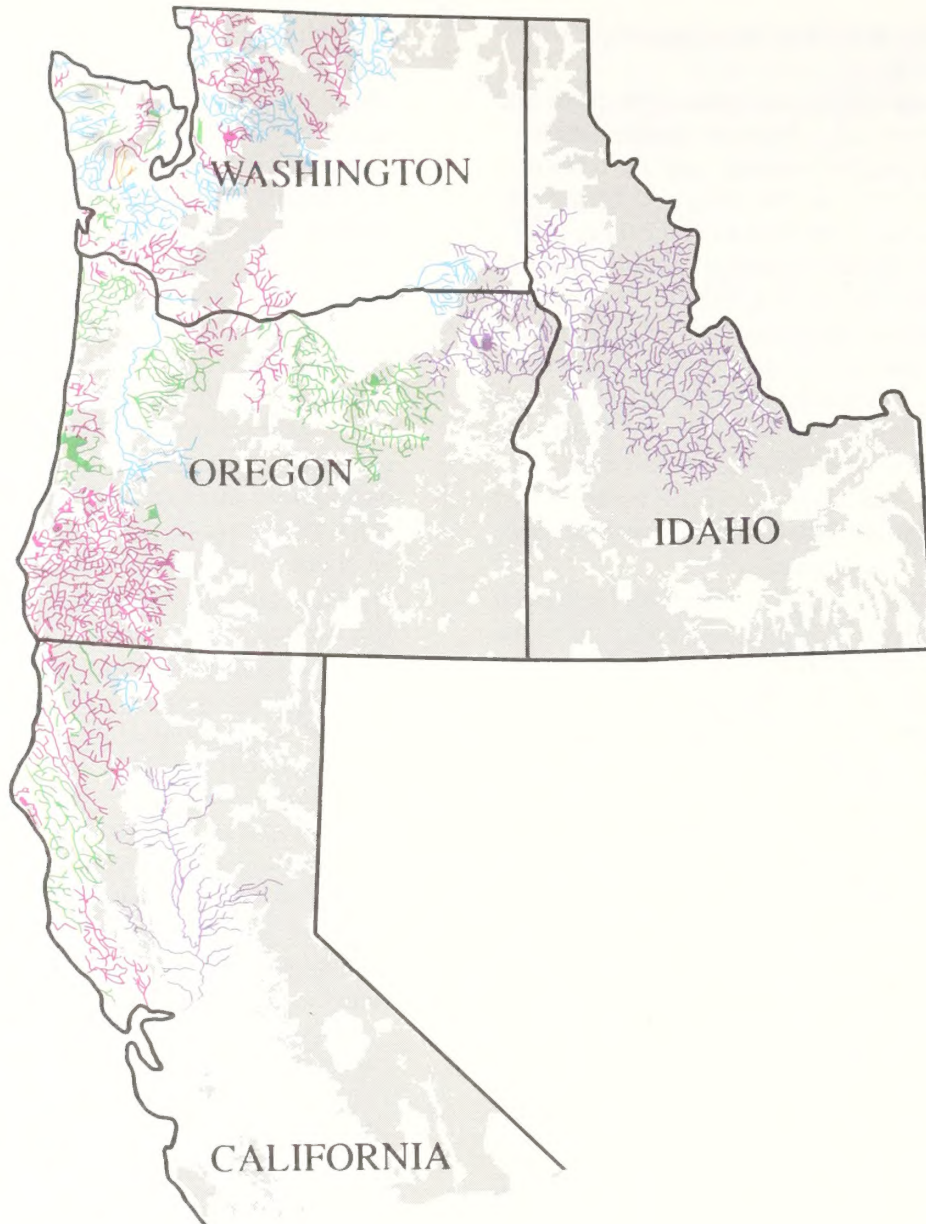
Johnson (1989) reported that more than 100 riparian species are considered special status in Arizona and New Mexico, mainly because of livestock grazing. For example, in Arizona's Tonto National Forest, improper grazing prevented the regeneration of trees essential to nesting bald eagles (Chaney and others 1990).

According to Nehlsen and others (1991), Pacific salmon stocks are at risk in California, Oregon, Idaho, and Washington. Map 3-5 shows the distribution of listed and at-risk salmon stocks in the Pacific Northwest. Much of the remaining spawning habitat is on federal lands. About 134 of the stocks at risk are found in national forests, and 109 on BLM-administered lands; both sets of land have degraded spawning and rearing habitats. About 77 percent of the stocks near public rangelands are at risk because of poor habitat conditions.

Understanding the current management of special status species is valuable in further understanding the positive impacts of making Range Betterment Funds available for improving degraded habitats. Many BLM and Forest Service conservation efforts will continue to benefit special status species. For example, the Forest Service has conservation policies in southern Nevada's Spring Mountains and BLM has policies to conserve Amargosa toads in southwest Nevada. However, these policies are not always practiced since the agencies lack key fac-



# Map 3-5. Distribution of Anadromous Fish



Albers Equal Area Projection

- Presently Listed
- High Risk of Extinction
- Moderate Risk of Extinction
- Special Concern
- Not Presently at Risk
- Bureau of Land Management and U.S. Forest Service

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tors such as surveys or funding for conservation programs. Because of inadequate conservation programs, animals such as desert tortoises must be listed.

Degraded habitats and direct loss in the desert Southwest, as caused by livestock grazing, contribute to decreasing populations of desert tortoises. BLM is studying the impacts livestock grazing has on desert tortoises, which could affect grazing practices on more than 6.5 million acres of desert tortoise habitats. Introduced exotic plants and fire regimes have also degraded or eliminated habitats.

## Biological Diversity

This section discusses biodiversity management as related to the alternatives described in Chapter 2, especially special status species, ecosystem processes, and the impetus behind those processes.

The increase in wildlife and plants classified as endangered, threatened, candidate, or sensitive is influencing national direction toward ecosystem management and Rangeland Reform '94. More than 1,100 special status plants are known or suspected to grow on BLM lands, including 60 percent of all federally listed threatened and endangered species. However, special status species are not the only species that require special management. For example, more than 50 million acres of BLM-administered lands in the lower 48 states have yet to be inventoried for special status plants (BLM 1992h).

Returning special status species to a nonspecial status individually is expensive. The agencies may recover an array of special status species, a goal in biodiversity management, by rehabilitating their habitats and surrounding ecosystems. But to successfully prevent extinction, habitats must be improved at suitable rate.

The urgency and degree of action needed for habitat stabilization or improvement is greatest for the most rapidly declining species. Successful recovery also depends on whether degraded habitats, which no longer support special status species, can

1. be rehabilitated to previously suitable habitat conditions or

2. serve as suitable habitat in some altered state that will still provide for the species in question.

For species declining at precipitous rates, immediate and total protection of their habitats may be required. Actions that are less timely and comprehensive will only lower rather than prevent the rate of extinction.

Managing for biodiversity entails recognizing plant and animal habitats and managing ecosystems and landscapes to sustain the processes that enabled those habitats to succeed and that contribute to their maintenance. For example, BLM and the Forest Service avoid letting land uses interfere with normal infiltration of annual precipitation into soil, which refills subsurface water reserves. The infiltration process ensures that the soil will not erode at unnatural rates. Soil compaction or a lack of plants and plant litter, however, can increase erosion.

Managing for biodiversity includes steps to prevent risks to natural habitats, biological processes, and the maintenance of biological diversity. Rangeland Reform '94 provides a means to evaluate grazing-induced processes as they affect federal rangelands. Grazing-induced processes have direct and indirect effects.

Examples of direct processes include forage removal and vegetation trampling exceeding what occurred before the livestock were introduced, and mechanical damage to soil from livestock using riparian areas or trailing along fencelines.

Indirect grazing-induced processes include the following:

- changes in stream channel characteristics and water quality as a result of using riparian areas;
- wholesale changes in plant communities resulting from the introduction of livestock;
- spread of such exotic plants as cheatgrass, medusahead wildrye, spotted and other knapweeds;
- altered precipitation infiltration and evapotranspiration regimes due to soil compaction exposure; and



- accelerated soil erosion as a result of hillside trailing.

Once the causes and rate of change to processes within an ecosystem are understood, BLM and Forest Service can act to maintain a desired rate of change.

After making management goals and action plans for ecosystems, the agencies must measure how effectively under the Proposed Action they can change the momentum of undesirable environmental processes, protect or restore the functions of desirable processes, and meet management goals.

If they cannot effectively deal with desirable and undesirable environmental processes, they will not meet their goals. Thus the extent of changes needed and the time needed for those changes to take effect are weighed against management alternatives to determine an effective course of action. The momentum of undesirable processes must first be slowed, then stopped. Then desirable processes can begin to take effect.

Some residual undesirable processes will likely remain for decades and even longer after livestock management is changed. Residual processes include long-term desertification resulting from the continued conversion, by wildfires, of shrubsteppe (sagebrush, desert shrub, and other vulnerable rangelands) to annual grasslands, fueled by cheatgrass and medusahead wildrye. By further reducing the total amount of shrubsteppe (or other) remaining habitat, this process would result in damage that in many cases could outweigh improvements in ecological condition. BLM and the Forest Service plan to slow or stop these processes while also implementing plans to protect and restore rangelands.

## *Wild Horses and Burros*

The Wild Free Roaming Horse and Burro Act of 1971 requires wild horses and burros to be managed at appropriate management levels and prohibits their relocation to areas where they had not lived before 1971. One of the Act's goals is to manage populations to create an ecological balance on federal land. Appropriate management levels have not been established on all herd management areas (HMAs) but are estimated to be 24,900 wild horses and 3,600 wild burros. HMAs with populations exceeding the appro-

priate management levels are managed to reduce the population by selective removals, fertility control, natural mortality, and other means.

At the end of fiscal year 1992, roughly 46,500 wild horses and 8,400 wild burros inhabited about 200 HMAs on federal land in Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, and Wyoming.

Wild horses and burros tend to compete with livestock for forage and water. Normally wild horses almost exclusively eat grasses. Burros have a more diverse diet of grasses, forbs, and shrubs. Wild horses and burros graze throughout their HMAs, including uplands and riparian areas. They migrate short distances during seasonal movements.

The most critical time of year is in the spring, during foaling season. During warm weather, wild horses and burros graze heavily around riparian areas, where they completely consume the forage before migrating. Wild horses' social structure, such as competition between stallions, causes dispersion. Wild burros tend to disperse as water becomes plentiful.

## *Recreation*

Managed for such recreation uses as hunting, fishing, camping, sightseeing, water sports, winter sports, and off-highway vehicle use, federal land helps satisfy the public's demand for outdoor recreation, a contributor to the western economy. Most recreation uses depend on natural and cultural features of the land.

Intensive recreation management focuses on 4,972 developed and 24,139 undeveloped recreation areas and sites. Less than 1 percent of the study area consists of intensively managed, developed recreation areas and sites. Most undeveloped recreation sites are accessible to grazing livestock. Approximately one percent of federal rangeland lies within riparian areas.

Federal land has a growing number and diversity of visitors seeking recreation. Because of the growing interest and participation in recreation, significant demands are placed on existing recreation sites and facilities. More recreation sites and facilities and upgrades of existing sites are needed to satisfy the demands of growing populations. On BLM-administered lands during 1992, recorded recreation use exceeded 74 million visitors.



Both agencies issue special use permits for competitive and commercial recreation activities: off-highway vehicle competitive events, outfitter and guide services, four-wheel drive treks, equestrian events, festivals, and tours.

Western federal land is renowned for its diverse scenic and visual resources. Relatively high quality air and dramatic topography make for spectacular vistas. The popularity of scenic and back country byways and scenic overlooks further illustrate the value and appreciation of scenic quality.

## ***Wilderness***

The Wilderness Act of 1964 does not preclude livestock grazing from wilderness, but some wilderness areas and wilderness study areas are not grazed because they lack forage or have steep and rough terrain.

BLM manages 1,660,551 acres of wilderness and is recommending 9,718,996 acres of wilderness study areas to Congress for designation. The Forest Service manages 28,826,092 acres of wilderness and is recommending 1,954,502 acres to Congress for designation. So far, Congress has acted only on the wilderness study area recommendations for federal land in Arizona.

## ***Paleontological and Cultural Resources***

### **Paleontological Resources**

Paleontological resources are the remains of plants and animals preserved in soils and sedimentary rocks. They are important for understanding past environments, environmental change, and the evolution of life. Federal legislation (e.g. Federal Land Policy and Management Act, National Environmental Policy Act) directs agencies to manage paleontological resources to preserve them for scientific and public uses.

The Forest Service and BLM found at least 5 million acres of sensitive fossil-bearing geological deposits on western federal land. The fossils range in age from the Precambrian (more than 500 million years ago) to the recent (the last 10,000 years) and includes examples of all extinct and living phyla.

Paleontological remains range from mammoths associated with the Ice Ages about 10,000 years ago, to the microorganisms associated with the earliest evidence of life some 2.8 billion years ago. Paleontological items discovered on federal land include dinosaur remains in Nevada, Utah, Colorado, Wyoming, California, and Montana; fossil fish deposits from the Green River Formation; insect and plant fossils found in Nevada; and large petrified trees in Arizona and Nevada.

Paleontological resources can be found in any sedimentary formation or soil deposition context, but badlands shale, sandstone, limestone outcrops, fault scarps, and eroded lands have a high potential for containing fossils.

### **Cultural Resources**

Cultural resources consist of the fragile and nonrenewable remains of human activity. They are found in historic districts, sites, buildings, and artifacts that are important in past and present human events. Cultural resources are divided into cultural properties and traditional lifeway values.

A traditional lifeway value is important for maintaining a specific group's traditional system of religious belief, cultural practice, or social interaction. A group's shared traditional lifeway values are abstract, nonmaterial, ascribed ideas that cannot be discovered except through discussions with members of the group. Lifeway values may or may not be closely associated with definite locations.

About 12.3 percent of the 166,442,728 acres of Forest Service-administered lands and 5.7 percent of the 177,633,566 acres of BLM-administered lands have had cultural property inventories. Native American properties and paleontological resources have not been systematically inventoried, and less than 1 percent of federal land has been examined. The results of cultural property inventories are shown in Tables 3-8 and 3-9. The number of nationally significant areas are listed by designation in Table 3-10. (The tables are not based on a distinction between total acreage managed by the agencies and rangelands managed by the agencies.)

Cultural resources are managed mainly through the Section 106 (National Historic Preservation Act) compliance process. Before authorizing surface disturbance, the BLM and Forest





<b>Table 3-8: Cultural Resource Inventory Data (Fiscal Year 1992 Annual Report)</b>					
<b>Agency</b>	<b>Federal Land Acres</b>	<b>Acres Inventoried</b>	<b>Percent Lands Inventoried</b>	<b>Sites Found</b>	<b>Eligible Sites</b>
FS	166,442,728	20,500,000	12.3	200,000	180,000
BLM	177,633,566	10,204,529	5.7	171,003	19,297

<b>Table 3-9: Cultural Resource Site Density Project (Fiscal Year 1992 Annual Report)</b>				
<b>Agency</b>	<b>Estimated Total Sites</b>	<b>Estimated Eligible Sites</b>	<b>Acres Per Site</b>	<b>Acres Per Eligible Site</b>
FS	1,623,831	1,461,448	102.5	113.9
BLM	2,976,705	335,909	59.7	528.8

<b>Table 3-10: Designated Nationally Significant Cultural Resource Areas</b>		
<b>Designation</b>	<b>Number</b>	<b>Estimated Acreage</b>
National Historic Trails	22	798,000 (2,494 miles)
National Register Listed Properties	1,034	432,913
National Historic Landmarks	12	117,167
Areas of Critical Environmental Concern	123	1,428,960
National Natural Landmarks	11	49,929
Research Natural Areas	5	10,537
<b>Totals</b>	<b>1,207</b>	<b>2,837,506</b>

Service must list cultural properties eligible for inclusion on the National Register of Historic Places and consider the effects of the proposed undertaking through the consultation process in Section 106 of the National Historic Preservation Act (NHPA) of 1966. This process is implemented in accordance with 36 CFR. In many states, procedures for adapting the process to local needs have been developed through programmatic agreements among BLM or Forest Service, the State Historic Preservation Officer, and the Advisory Council on Historic Preservation.

Section 106 of NHPA does not prohibit disturbing cultural resources. In fact, an authorized officer may permit activities that damage or destroy them. In addition, mitigation is required only if disturbance would affect a property's attributes that make it eligible for the National Register.

In recent years, with an awareness and appreciation of cultural properties and traditional lifeway values, the inventory, protection, stabilization, and enhancement of cultural resources have become integral parts of Forest Service and BLM practices.

### **Prehistoric, Historic, and Modern Eras**

Prehistoric properties found in the U.S. extend back to the earliest human migrations to the Western Hemisphere, some 15,000 years ago. Prehistoric properties range from isolated artifacts, through small scale habitation sites, to complex agricultural villages and densely populated pueblos. Prehistoric human occupations were rarely uniform over large areas, particu-



larly where there were significant ecological changes over short distances. Consequently, site types, sizes, and densities are extremely variable.

Prehistoric cultural resources have been organized into early, middle, and late periods, with the early period commonly referred to as Paleoindian (15,000-8,000 years ago), the middle period as Archaic (8,000-2,000 years ago), and the final period as Late Prehistoric (2,000-200 years ago).

Cultural resources from the Paleoindian period are found in high-elevation coniferous and deciduous forests as well as lower elevation plains grasslands and in parts of the desert Southwest, mainly near water sources and in alluvial and colluvial soil deposits. People surviving during this period often hunted megafauna, such as mammoth and giant bison, that are now extinct.

Prehistoric cultural resources from the Archaic period reflect a shift from an exploitation of megafauna to an emphasis on hunting and collecting a variety of resources, such as fish, large and small game, and edible plants and nuts. Hunting sites, plant gathering sites, and temporary camps are likely scattered in most western ecosystems.

Beginning about 2,000 years ago, the Archaic period phased into the Late Prehistoric period with the introduction of agriculture, ceramics, the bow and arrow, and sedentary lifeways as major adaptive elements. In general, site types and patterns were the same as during archaic times except where lifeways shifted to an agricultural base.

The Prehistoric era began blending into the Historic era in 1492 when Europeans started significant migrations to the Americas. The historic period began in the Southwest in the 1500s with the Spanish *entrada*, while in the Pacific Northwest and the Great Basin, significant migration effects did not begin before the middle of the 1800s. In the Rocky Mountains and Plains the historic era did not begin until the exploitation of the region by the fur trade in the late 1700s and early 1800s.

Cultural properties related to the Historic era continue to include indigenous remains, but the resources are now dominated by artifacts, sites, and landscapes associated with early Euro-American exploration, the fur trade, mining, logging, ranching, farming, transportation, manufacturing, and urban development.

Beginning about 1900, the Historic era blends into modern times in ways that preserve elements of traditional and historic cultures and lifeways. For example, Native Americans continue traditional religious beliefs and practices and in many cases have maintained treaty rights to exploit traditional plant gathering and hunting areas. Other groups such as Mormon ranchers have maintained traditional cultural beliefs and practices. Cultural properties of the Modern era may include areas for gathering plants, animals, or minerals. They may also include areas and landscapes that embody religious symbolism or practices, or landscapes that exemplify the effects of a historic lifeway, such as ranching or mining.

## Native Americans

Native Americans use their local environments to gather native plants, animals, and minerals for use in religious ceremonies, rites of passage, folk medicine, subsistence, and crafts. In Native American religious practice, any environment can contain specific places that are significant for spiritual purposes. Those sacred places embodying spiritual values are often associated with indigenous rock art, medicine wheels, rock cairns and effigy figures, spirit trails and spirit gates, caves, and springs or lakes. Contemporary use areas are associated with traditional plant and mineral collection locales, vision quest sites, sun dance grounds, shrines, and traditional trails.

Federal concerns with Native American traditional lifeway values respond to the American Indian Religious Free Act of 1978 requiring federal agencies to evaluate their policies and procedures with the aim of protecting the religious freedom of Native Americans (Public Law 95-341 §2).

## Livestock Industry

Participants in the traditional ranching life are carrying forward a significant part of the world's image of America and America's image of itself. Western ranching communities have traditional activities, social behaviors, and values that are part of the Nation's historic, cultural, and natural heritage. To maintain these traditional lifeway values, federal agencies, as



required by the National Environmental Policy Act, respect these characteristics and a variety of individual choices.

The traditional western ranching culture can be traced to the 1600s in the Southwest and the 1850s in the North. It involves the production of cattle and sheep, mainly through grazing and haying of forage. The identity of many small towns and communities in the region is associated with this tradition.

The livestock industry has an associated landscape and a series of traditional cultural properties that includes livestock, developed springs, wells, and watering tanks in the uplands. Fencelines, wild horse traps, corrals, ranch houses, sheep herding camps, shearing pens, loading chutes, grange halls and community centers, and one-room school houses are all traditional cultural properties that contribute to the "built environment" of the traditional western ranching culture.

### Economic Conditions

The description of economic conditions addresses the 16 western states where grazing is

allowed on federal land, all of which would be affected by changes in rangeland management. The 16 states are Washington, Oregon, California, Arizona, New Mexico, Colorado, Wyoming, Montana, Idaho, Nevada, Utah, North Dakota, South Dakota, Nebraska, Kansas, and Oklahoma. Texas is not included due to the small amount of livestock grazing on federal lands in relation to the state's economy.

This section is organized into the following major sections: 1) Regional economy and trends, including subsections on trends in the agriculture industry and on livestock operations on federal lands; 2) Ranch income and operations; 3) Permit value; and 4) Grazing fee receipts and payments.

### The Western Regional Economy and Trends

The economy of the western states, like the Nation, is highly diversified. Employment trends by industry are shown by the number of persons employed in Table 3-11 and Figure 3-4, and percentage of total employment in Table 3-12 and Figure 3-5.

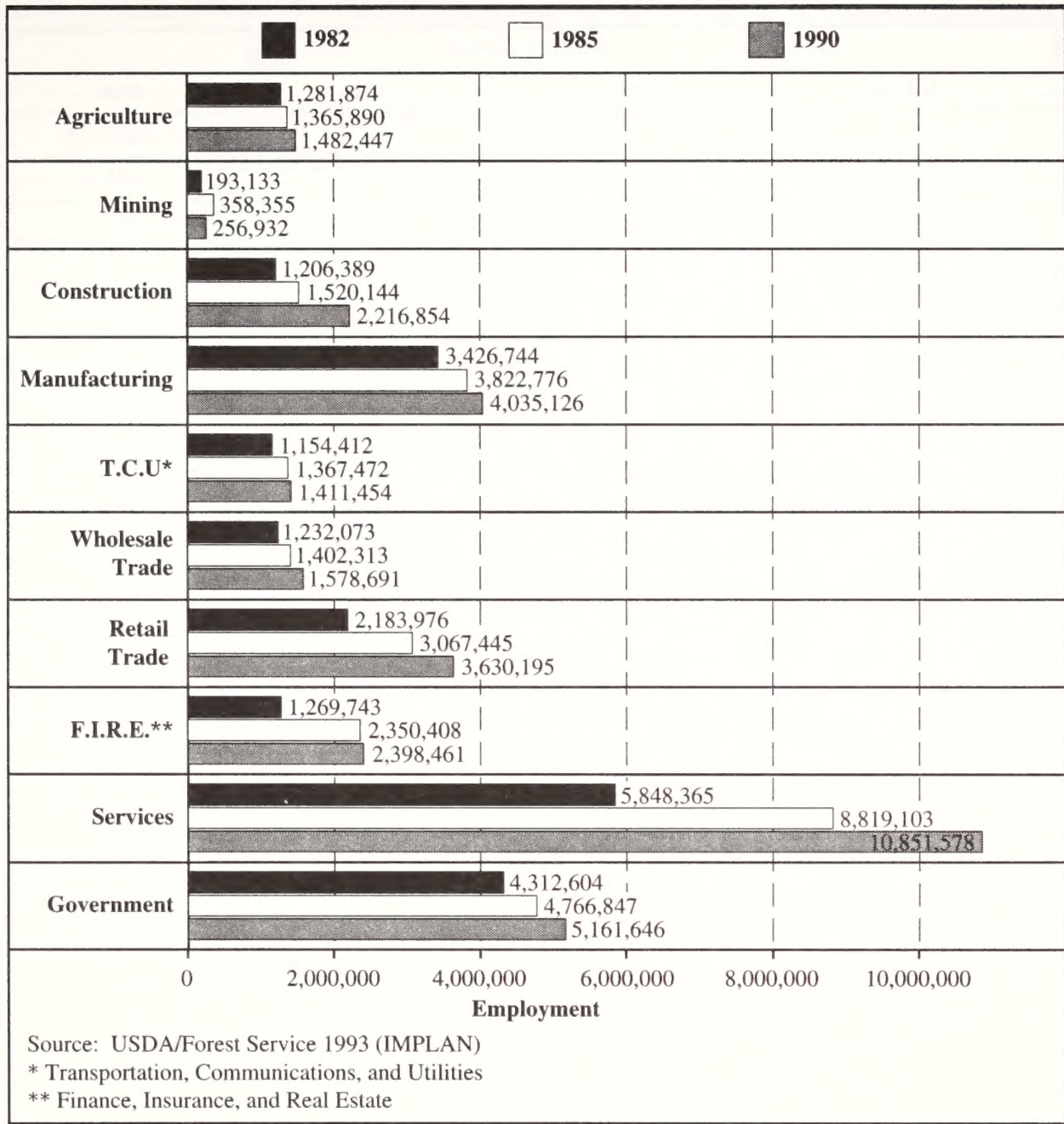
**Table 3-11: Western Region Total Employment by Industry**

Industry	1982	1985	1990
Agriculture	1,281,874	1,365,890	1,482,447
Mining	193,133	358,355	256,932
Construction	1,206,389	1,520,144	2,216,854
Manufacturing	3,426,744	3,822,776	4,035,126
T.C.U. <sup>1</sup>	1,154,412	1,367,472	1,411,454
Wholesale Trade	1,232,073	1,402,313	1,578,691
Retail Trade	2,183,976	3,067,445	3,630,195
F.I.R.E. <sup>2</sup>	1,269,743	2,350,408	2,398,461
Services	5,848,365	8,819,103	10,851,578
Government (Federal, State, and Local)	4,312,604	4,766,847	5,161,646
<b>Totals</b>	<b>22,109,313</b>	<b>28,840,753</b>	<b>33,023,384</b>
<sup>1</sup> Transportation, Communications, and Utilities			
<sup>2</sup> Finance, Insurance, and Real Estate			
Source: Forest Service 1993e (IMPLAN)			





**Figure 3-4: Western Region Total Employment by Industry in 1982, 1985, and 1990.**







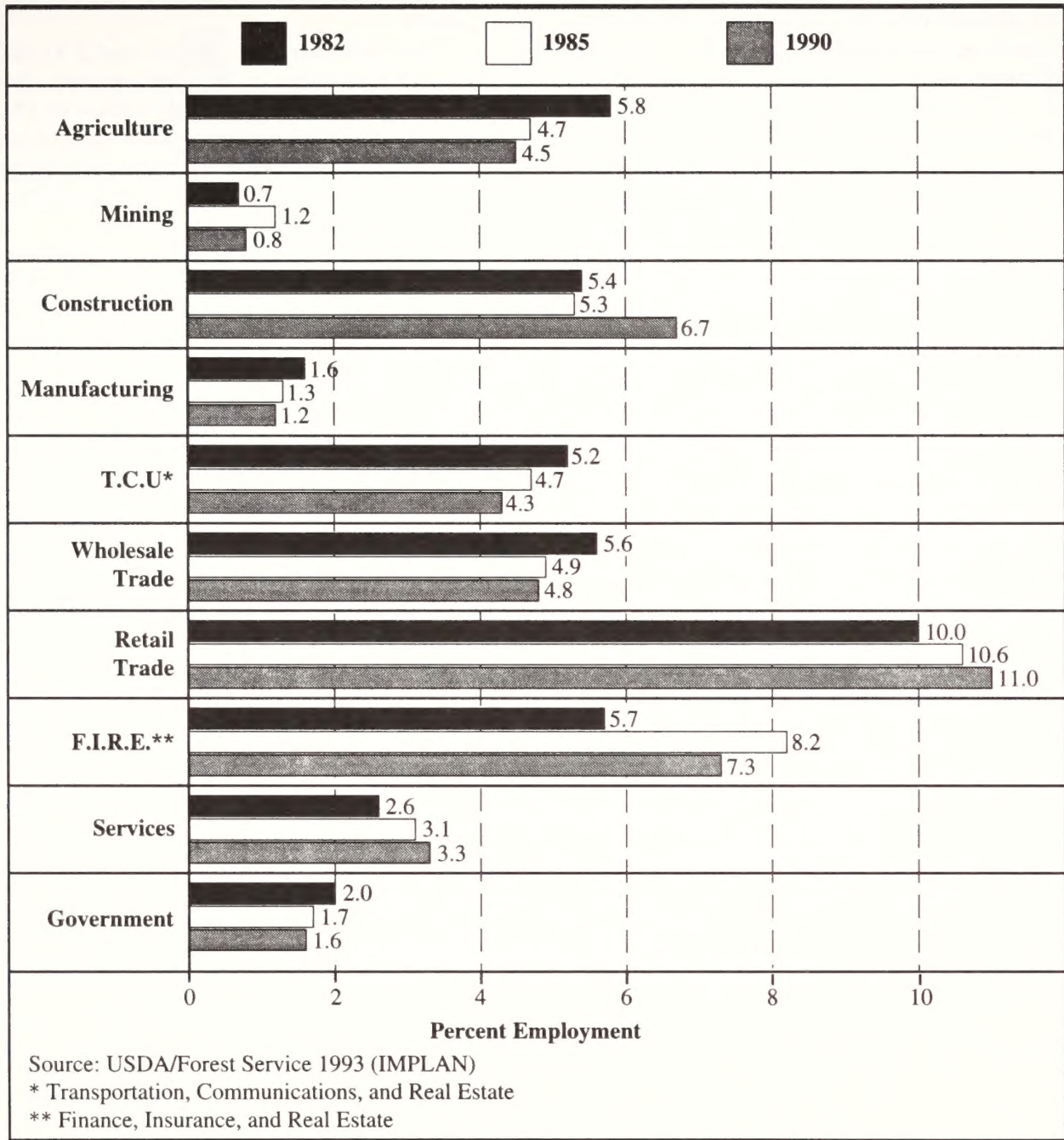
**Table 3-12: Western Region Percent of Total Employment by Industry**

<b>Percent (rounded)</b>			
<b>Industry</b>	<b>1982</b>	<b>1985</b>	<b>1990</b>
Agriculture	5.8	4.7	4.5
Mining	0.9	1.2	0.8
Construction	5.5	5.3	6.7
Manufacturing	15.5	13.3	12.2
T.C.U. <sup>1</sup>	5.2	4.7	4.3
Wholesale Trade	5.6	4.9	4.8
Retail Trade	10.0	10.6	11.0
F.I.R.E. <sup>2</sup>	5.7	8.2	7.3
Services	26.5	30.6	32.9
Government (Federal, State, and Local)	19.5	16.5	15.6
<b>Totals (rounded)</b>	<b>100.00</b>	<b>100.00</b>	<b>100.0</b>
<sup>1</sup> Transportation, Communications, and Utilities			
<sup>2</sup> Finance, Insurance, and Real Estate			
Source: Forest Service, 1993e (IMPLAN)			





**Figure 3-5: Western Region Total Employment by Industry (percent) in 1982, 1985, and 1990.**





The region employed over 22 million persons in 1982. This figure increased to exceed 33 million in 1990. (See Table 3-11.) Employment in all industries grew over this period, but the industries have experienced relatively significant changes.

Industries in which employment has increased as a percentage of total employment include services; finance, insurance, and real estate; construction; and retail trade. Industries that have decreased as a percentage of total employment include government; manufacturing; agriculture; transportation, communications, utilities; and mining. (See Table 3-12 and Figure 3-5.)

Employment in the agriculture industry grew from 1.28 million jobs in 1982 to 1.48 million in 1990. (See Table 3-11.) Despite this growth, agriculture has declined relative to the rest of the economy. In 1982, agricultural employment accounted for 5.8 percent of total employment; by 1990 that figure had decreased to 4.5 percent. (See Table 3-12 and Figure 3-5.)

Income trends by industry are shown in Table 3-13 and Figure 3-6. Table 3-14 and Figure 3-7 show income trends as percentages of total income.

The 16 western-state region had a \$1 trillion dollar economy in 1982 (1993 dollars). This figure increased to about \$1.35 trillion in 1990 (Table 3-13). All sectors except agriculture showed positive growth in income over the period. But the sectors have experienced relatively significant changes.

Industries whose income has increased as a percentage of total income include services, manufacturing, and retail trade. Industries whose income has decreased as a percentage of total income include government; agriculture; wholesale trade; finance, insurance, and real estate; transportation, communications, and utilities; construction; and mining (Table 3-14 and Figure 3-7).

Income in the agriculture industry grew between 1982 and 1985, but by 1990 had fallen back to its 1982 level of \$32.9 billion (in 1993

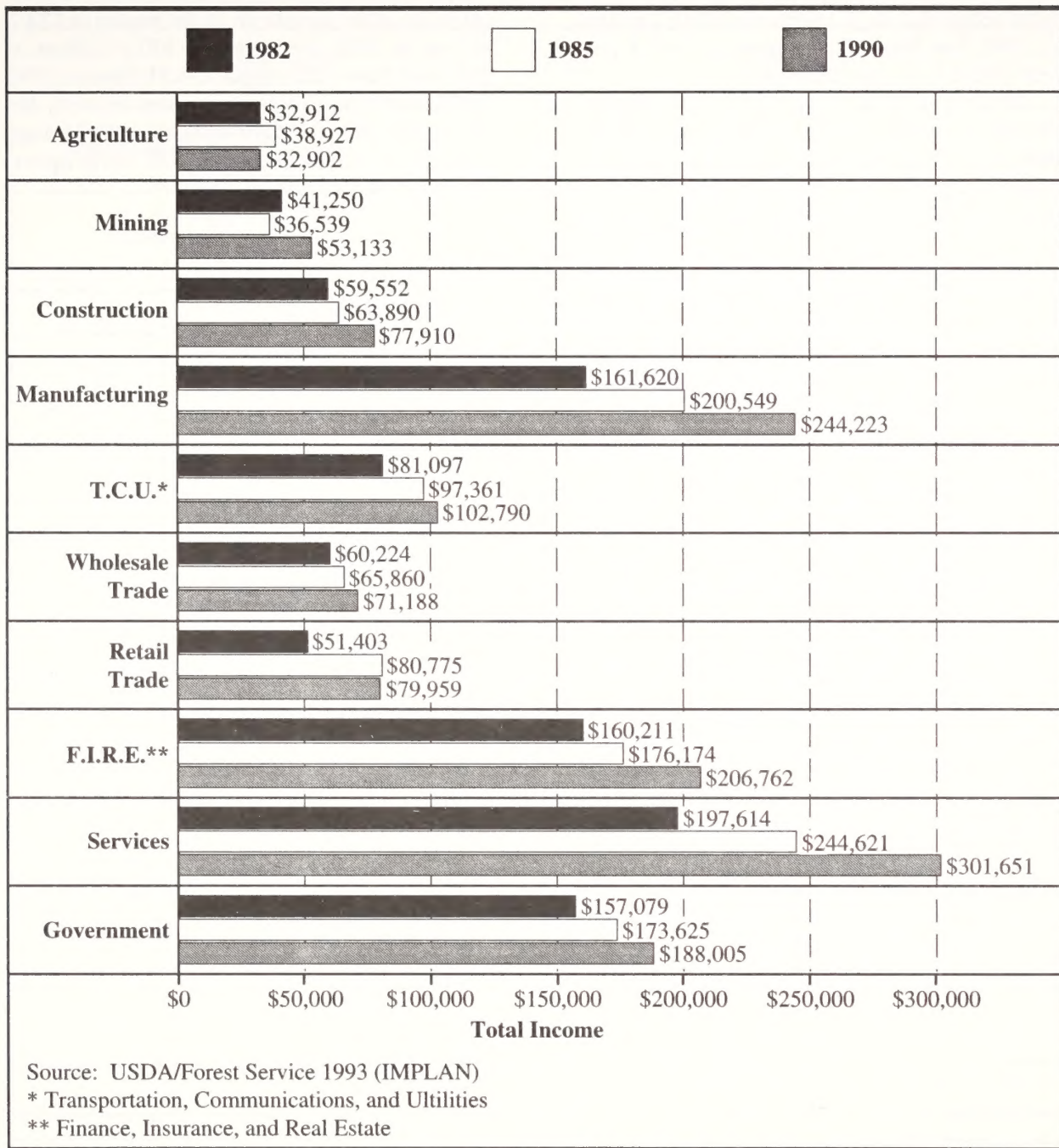
**Table 3-13: Western Region Total Income by Industry <sup>1</sup>**

Income in Millions of 1993 Dollars			
Industry	1982	1985	1990
Agriculture	32,912.0	38,927.5	32,902.8
Mining	41,250.0	36,539.5	53,132.9
Construction	59,552.0	63,890.0	77,910.3
Manufacturing	161,620.8	200,549.3	244,223.0
T.C.U. <sup>2</sup>	81,097.0	97,361.0	102,789.9
Wholesale Trade	60,224.5	65,860.4	71,187.7
Retail Trade	51,403.1	80,774.9	79,958.5
F.I.R.E. <sup>3</sup>	160,211.4	176,174.6	206,762.4
Services	197,613.7	244,620.5	301,650.8
Government (Federal, State and Local)	157,079.8	173,624.9	188,004.8
<b>Total</b>	<b>1,002,964.0</b>	<b>1,158,323.0</b>	<b>1,358,523.0</b>
<sup>1</sup> Total Income includes personal income and property income			
<sup>2</sup> Transportation, Communications, and Utilities			
<sup>3</sup> Finance, Insurance, and Real Estate			
Source: Forest Service, 1993e (IMPLAN)			





**Figure 3-6: Western Region Total Income by Industry (Millions of Dollars) in 1982, 1985, and 1990.**





dollars). As with employment, income in the agriculture sector has declined relative to the rest of the economy. In 1982, agriculture income accounted for 3.3 percent of total income; by 1990 that figure had decreased to 2.4 percent (Table 3-14 and Figure 3-7).

Income data for agriculture were supplemented by USDA reports (Williams and others 1989; Strickland and others 1991) showing the value of cash receipts to cattle operations for 1982, 1985 and 1990. (Cash receipts for sheep

operations are included in 1990.) Income data are helpful in understanding the trends within the agriculture industry. Income data show receipts to cattle operations in the region as \$23.2 billion in 1982, declining to \$20.6 billion in 1985, and then climbing to \$24.2 billion in 1990 (1993 dollars). (Including gross receipts for sheep operations of \$190 million in 1990 brings total gross receipts to sheep and cattle operations to \$24.4 billion in 1990.)

**Table 3-14: Western Region Percent of Total Income by Industry <sup>1</sup>**

Percent (rounded)			
Industry	1982	1985	1990
Agriculture	3.3	3.4	2.4
Mining	4.1	3.2	3.9
Construction	5.9	5.5	5.7
Manufacturing	16.1	17.3	18.0
T.C.U. <sup>2</sup>	8.1	8.4	7.6
Wholesale Trade	6.0	5.7	5.2
Retail Trade	5.1	7.0	5.9
F.I.R.E. <sup>3</sup>	16.0	15.2	15.2
Services	19.7	19.4	22.2
Government (Federal, State and Local)	15.7	15.0	13.8
<b>Totals (rounded)</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

<sup>1</sup> Total Income includes personal income and property income

<sup>2</sup> Transportation, Communications, and Utilities

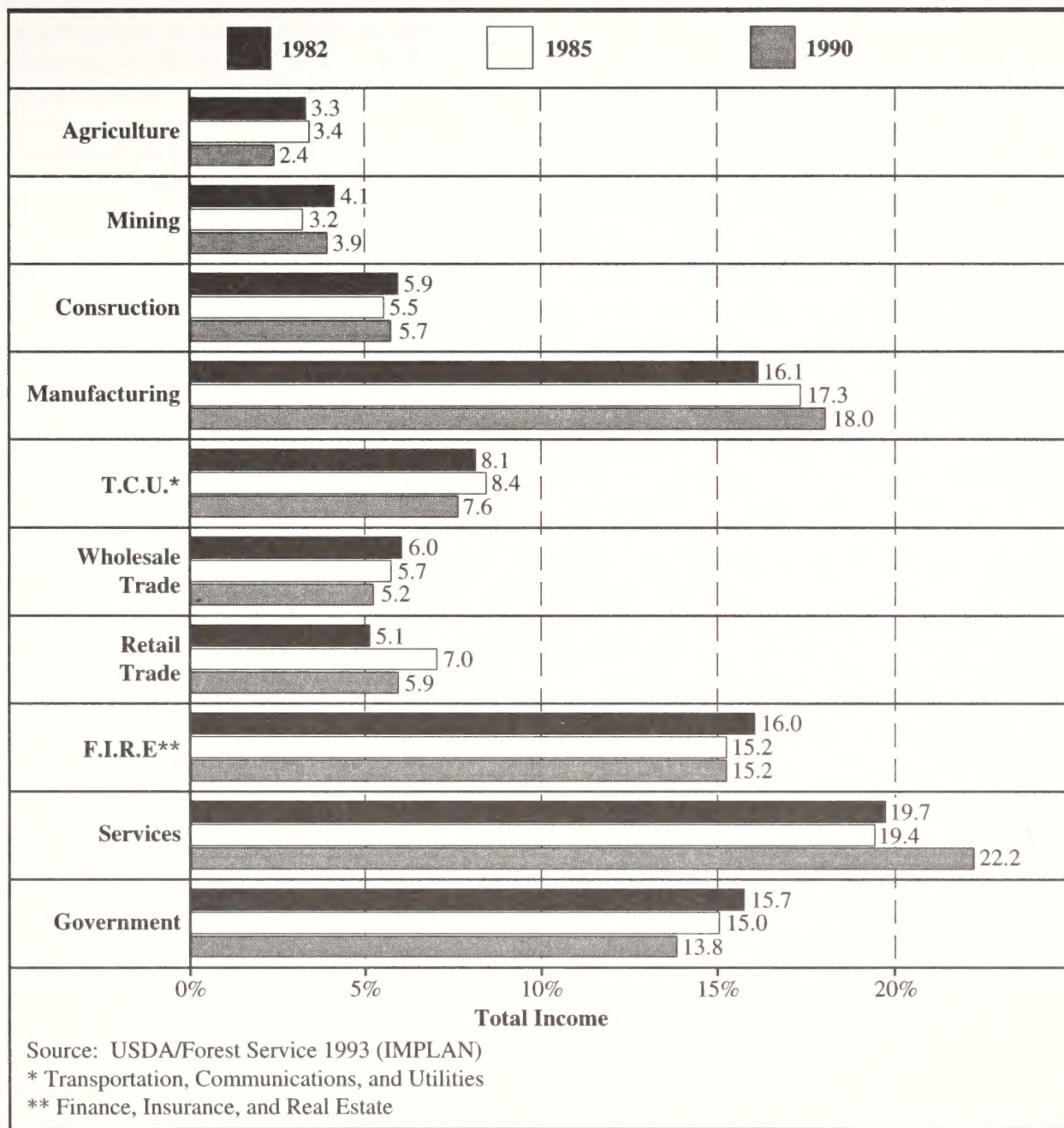
<sup>3</sup> Finance, Insurance, and Real Estate

Source: Forest Service 1993e (IMPLAN)





**Figure 3-7: Western Region Total Income by Industry (Percent) in 1982, 1985, and 1990.**





## Structural Change in the U.S. Farm Sector and Livestock Industry

This section discusses ongoing structural change in the U.S. farm sector and the livestock industry and helps explain the trends in agricultural employment and income described in the previous section. This information is excerpted from *Structural Change in the U.S. Farm Sector, 1974-1987* (Reimund and Gale 1992).

The general trend toward fewer but larger farms established during the 1950s and 1960s continued during the 1970s and 1980s, albeit at a slower pace. In the 1970s, favorable economic conditions and strong worldwide demand for U.S. farm products encouraged investment and borrowing in agricultural industries. The economic conditions during the 1980s made farming less attractive to entrepreneurs and investors. In addition, real farm incomes declined during the 1980s due to lower output prices and higher costs. Land prices, which rose significantly in the 1970s, declined in the 1980s.

The boom and bust cycle affected farm balance sheets. By 1988, real net farm income was about three-fourths that of 1974. Government payments and off-the-farm income enabled many farmers to continue farming during the 1980s. Today, relatively stable off-the-farm income raises the household income of farmers and moderates the annual fluctuation in net farm income.

### Trends in the Size, Number, Ownership, and Organization of Farms

Farmers have needed to adapt to changing technology and adopt advanced management practices to survive in today's complex and volatile farm economy. Between 1974 and 1987, farms with 50 to 499 acres dropped from 62 to 53 percent of all farms, declining the most of all farm sizes. The distribution of farms by type of business organization (family farms versus corporate farms) did not significantly change from 1978 to 1987.

Tenure status (full-time owner, part-time owner, or tenant) did not change significantly between 1974 to 1987 either, but the number of farmers whose main occupation was not farm-

ing increased substantially. Part-time farming has become a permanent and growing part of U.S. agriculture. Rural economic diversification has enabled many people, especially small-farm operators, to remain in farming on a part-time basis while earning their livelihoods from off-the-farm employment.

### Effects of Recent Economic Events on Farm Size and Numbers

Regional differences in entry, exit, and changes in farm size emerged during the 1970s. All regions rapidly lost farms in the 1960s, but the West gained farms in the 1970s. Many of the new farms in the West were small part-time farms, which caused a decrease in the average farm size. During the 1980s, the West held a stable number of farms with a downward trend in the Plains. The Plains area is losing farms, while its average size of farms is increasing. Compared to prior years, the loss of farms during the 1980s was probably caused by a greatly reduced entry rate rather than an increased exit rate. Compared to other age groups, people less than 35 years old had the greatest decline in farm start-ups (40 to 50 percent) from 1982 to 1987, though this is the most common age group for people starting full-time farms.

### The Cattle-Raising Subsector

Nationally, the cattle-raising subsector consists of nearly 650,000 ranches. Most ranches are small, specializing in cow-calf and feeder cattle production (not cattle feedlots). Although large-scale ranches exist, they are the exception rather than the rule. Cattle raising works well as a small-scale production. In 1987, 85 percent of beef cattle ranches had less than \$25,000 annual sales, most operators worked full-time off the ranch, and operations were well suited to small-scale production.

Beef cattle raising is concentrated in eastern Texas, eastern Oklahoma, the Gulf Coast and southeast states, where farms are often small, part-time operations, and operators own most land used for raising cattle. Nationally, only 38 percent of the land used for cattle raising is leased. In western states, a substantial amount of federal land is leased but nearly 70 percent of cattle raisers own all the land they operate.



## Farm Households and Farm Businesses

The growth of alternative income for households with small farms, coupled with the increasingly industrialized, affluent, large-farm components within the farm sector have brought farmers into the American mainstream. Farm household income statistics no longer portray farmers as a disadvantaged group. The growing importance of off-the-farm income implies that most small farm operators believe public policies that strengthen the rural nonagricultural economy are more important to maintaining their household income than agricultural commodity programs and policies.

Although the average farmer's household income was on a par with that of all U.S. households by the end of the 1980s, the distribution of each group's household income is different. The 1988 median income for farm households was about 29 percent lower than all U.S. households, showing that a higher proportion of farm households have low incomes. Farm households have substantially higher average net worth than average U.S. households because of the capital-intensive nature of farming.

Some observations were made about farm households and farm businesses in the 1980s.

- Farms accounted for a significant portion of small businesses but a small portion of total sales of U.S. businesses.
- Agricultural and nonagricultural industries contained high proportions of small firms.
- Midsized farms receive a return on assets comparable to nonfarm businesses of similar size.
- Farms generate lower gross returns on assets than most other businesses, but their net returns are comparable.
- To earn an income equivalent to the U.S. average household income, farms do not need more assets than nonfarm businesses.
- Farms create fewer direct employment opportunities because they have a fairly high level of capital per employee.

## Livestock Operations and Production on Federal Lands in the West

BLM and Forest Service grazing statistical records show about 26,900 permits to graze livestock on federal rangelands (Forest Service 1993a and BLM 1993d). Because many livestock operators hold more than one permit, the total number of operators is less than the number of permits. In addition, about 14 percent of operators with federal permits hold both Forest Service and BLM permits (Forest Service and BLM 1992). In a recent survey of the western livestock industry, Fowler and others (1993) estimated that 22,350 livestock operators hold federal permits.

The roughly 21,000 beef cattle producers with federal permits make up 6 percent of total producers in the 17 western states. Excluding Texas, cattle producers with federal permits make up about 9 percent of the total producers. In the 11 western states, where federal rangeland is concentrated, permittees and lessees make up 22 percent of total beef producers. Beef cattle producers with federal permits make up about 3 percent of the 907,000 producers in the 48 contiguous states. (See Table 3-15 and Map 3-6.)

The roughly 4,600 sheep producers with federal permits make up about 12 percent of total sheep producers in the 16 western states. (No sheep producers in Texas have federal permits.) In the 11 western states, sheep producers with federal permits make up about 19 percent of the total producers. (See Table 3-16.)

The western livestock industry and federal forage are economically important, regionally and locally. This importance can be expressed in a variety of ways: the contribution of the livestock industry to rural economic activity, types of animals grazed on federal lands, rancher dependence on federal forage, and size of ranch operations with federal permits.

Federal rangelands are essential to the economic vitality of many family farms and ranches. Some full-time operators rely heavily on federal rangelands for livestock forage. For many operators, federal rangelands help maintain livestock operations that supplement family income. In some western communities, ranching is the main economic activity.





**Table 3-15: Beef Cattle and Beef Cattle Producers in the United States in 1993**

Region	Beef Cattle <sup>1</sup>	Producers <sup>1</sup>	Producers with Federal Permits and Leases <sup>2</sup>	Percent of Producers with Federal Grazing Permits
11-State Western Region	16,020,000	96,700	21,132	22.0
5-State Central West Region	22,090,000	137,500	952	0.7
Texas	13,820,000	125,000	163	0.1
<b>Totals: 17 Western States</b>	<b>51,930,000</b>	<b>359,200</b>	<b>22,247</b>	<b>6.0</b>
Eastern Region	34,724,000	547,500	570 <sup>3</sup>	0.1
<b>Totals: 48 Contiguous States</b>	<b>86,654,000</b>	<b>906,700</b>	<b>22,817</b>	<b>3.0</b>

<sup>1</sup> NASS 1993a. Includes cattle on feed.

<sup>2</sup> Forest Service 1993a; BLM 1993d. Number of producers includes cattle producers who also run sheep.

<sup>3</sup> These are Forest Service permits, which would not be affected by the fee alternatives in this EIS; however, they would be affected by portions of the management alternatives specific to the Forest Service.

**Table 3-16: Sheep and Sheep Producers in the United States in 1993**

Region	Sheep and Lambs <sup>1</sup>	Producers <sup>1</sup>	Producers with Federal Permits and Leases <sup>2</sup>	Percent of Producers with Federal Grazing Permits
11-State Western Region	5,010,000	23,300	4,502	19
5-State Central West Region	1,237,000	13,400	147	1
Texas	2,000,000	8,000	0	0
<b>Totals: 17 Western States</b>	<b>8,247,000</b>	<b>44,700</b>	<b>4,649</b>	<b>10</b>
Eastern Region	1,942,000	56,300	N/A <sup>3</sup>	N/A <sup>3</sup>
<b>Totals: 48 Contiguous States</b>	<b>10,189,000</b>	<b>101,000</b>	<b>4,649</b>	<b>5</b>

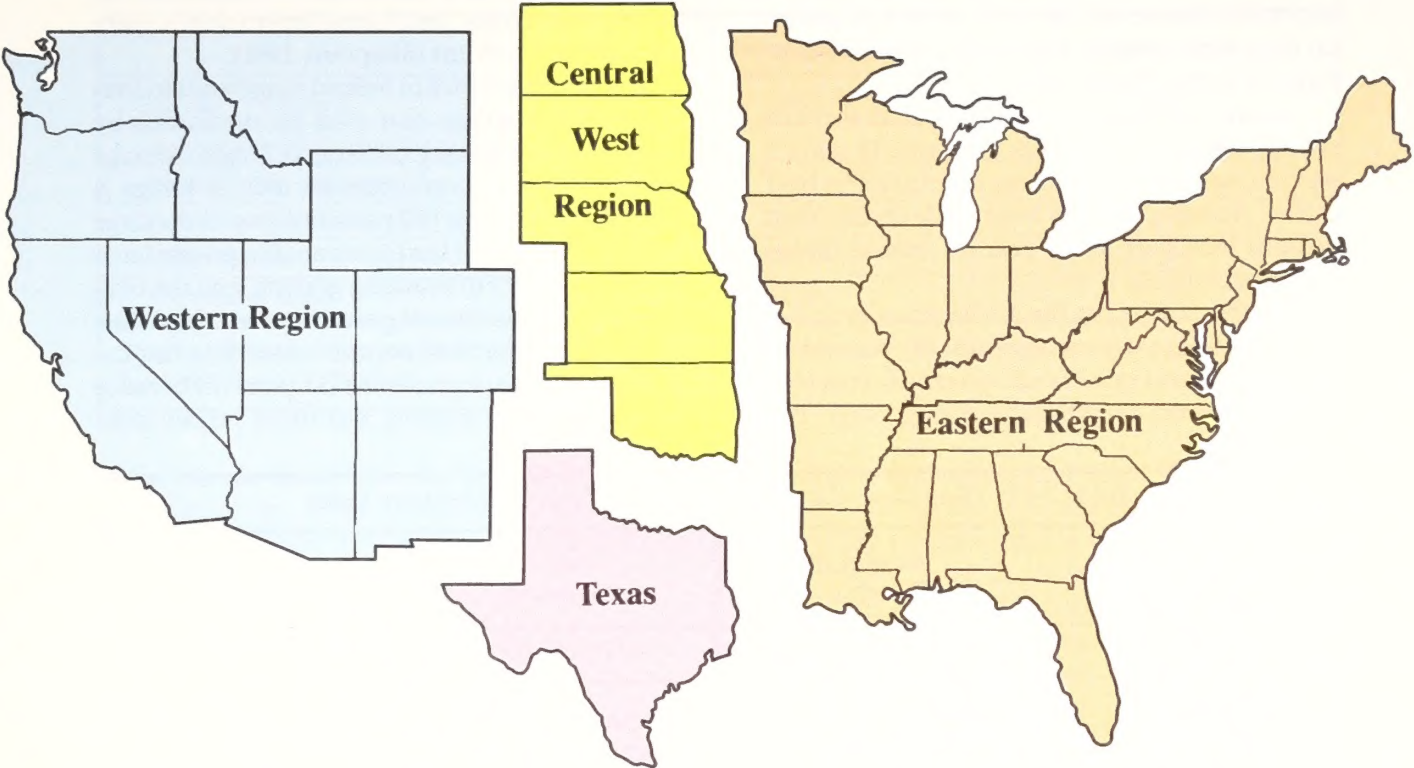
<sup>1</sup> NASS 1993b.

<sup>2</sup> Forest Service 1993a; BLM 1993d. Many producers do not exclusively raise sheep but also run cattle.

<sup>3</sup> The number of sheep operators is not in the data base, but in fiscal year 1992 about 750 sheep were permitted to graze on National Forest System lands in the entire eastern U.S.



# Map 3-6. Livestock Producers in the United States



Source: USDA, National Agriculture Statistics Service, 1993



The importance of federal rangelands varies by the type of animal grazed. Permitted use on federal lands makes up about 7 percent of beef cattle forage and about 2 percent of the total feed consumed by beef cattle in the 48 contiguous states (Joyce 1989).

In the 16 (excluding Texas) and 11 western states permitted use makes up about 12 and 25 percent respectively of forage consumed by beef cattle. About a third of beef cattle in the West graze at least part of the year on federal rangeland (Joyce 1989).

A 1991 report by the USDA Economic Research Service states that nearly 80 percent of all pastures and rangelands grazed by sheep in 11 western states are private (Shapouri 1991). The

remainder are federal and state administered. BLM-administered land makes up about 5 percent of the overall annual feed requirements for sheep operations, and Forest Service lands make up about 6 percent (Shapouri 1991).

The importance of federal rangelands to livestock production can also be measured by rancher dependency on federal forage. Average dependency of permittees on federal forage is highest in Arizona (60 percent), due to the large amount of federal land compared to private land, the availability of yearlong grazing, and the relatively high number of permittees who have Forest Service and BLM permits. Montana has the lowest average dependency (11 percent) because it has seasonal grazing and more private than

**Table 3-17: Dependency Levels for Permitted Herds in 13 Western States**

State	Number of Permittees	Cattle % Dependent	Sheep % Dependent
Arizona	1,090	60	*
California	1,465	15	24
Colorado	2,670	25	37
Idaho	3,675	23	35
Montana	4,710	11	35
Nebraska	120	13	*
Nevada	930	36	43
New Mexico	3,000	44	49
Oregon	1,790	23	27
South Dakota	640	12	*
Utah	3,110	35	47
Washington	450	13	*
Wyoming	2,940	23	29

Does not include national grasslands.

\*Sheep budgets were not prepared since few sheep graze on federal land.

Source: Forest Service and BLM 1992.

federal forage. Table 3-17 shows average dependency on federal forage for permittees in each of the 13 western states.

Livestock operations with federal permits are on average larger than operations without federal permits. Data from the 1990 Farm Costs and Returns Survey (FCRS), which contains

ranch survey information on 6,678 permittees and 49,658 nonpermittees, shows that permittees on the average have more than twice as many cows as nonpermittees, 221 cows versus 93 cows. In addition, permittees average almost nine times as many sheep as nonpermittees, 112 sheep versus 13 sheep. Table 3-18 shows the





**Table 3-18: Ranch and Herd Sizes, Permittees, and Nonpermittees in 1990**

	Permittees	Nonpermittees
Number of Ranches	6,678	49,658
Average Herd Size (Number of Cows)	221	93
<b>Percent of Operations with:</b>		
Fewer than 100 Cows	33.9%	61.6%
100 to 499 Cows	56.9%	35.1%
500 or more Cows	9.2%	3.3%
Source: 1990 Farm Costs and Returns Survey (See Appendix G, Economic Aspects of Supply and Demand for Livestock Forage on Public Lands.)		

variation in herd size for permittees and nonpermittees. (See Appendix G, Economic Aspects of Supply and Demand for Livestock Forage on Public Lands.)

### Ranch Income and Operations

The 1990 Farm Costs and Returns Survey (FCRS) gives cost and return data for cow-calf

operations (Shapouri and others 1993). The cow-calf version of the FCRS was a probability-based, stratified random sample of U.S. beef cow-calf operations in the 31 most important beef cow-calf states. The cost and return data used in this EIS is a subset of this data and represents costs and returns for permittees and nonpermittees in 10 western states (California, Colorado, Idaho, Montana, New Mexico, North Dakota, Oregon, South Dakota, Utah, and Wyoming).

**Table 3-19: Cow/calf production cash costs and returns per cow for the Western region and for permittees and nonpermittees in 10 Western and Great Plains states, 1990**

Item	Non-permittees	Permittees	Non-permittees	Permittees
	Dollars per Ranch		Dollars per Cow	
Cash receipts	46,205	95,502	496	431
<b>Cash Expenses:</b>				
Feeder cattle	4,446	1,152	48	5
Forest Service/Bureau of Land Management pasture	NA	2,768	NA	13
Other public pasture	521	625	6	3
Total other feed costs	16,635	27,050	179	122
Other variable cash expenses	8,338	21,920	90	102
Total variable cash expenses	29,921	53,515	321	245
Total fixed cash expenses	12,057	22,227	129	100
Total cash expenses	41,977	75,742	451	345
Cash receipts less cash expenses	4,228	19,760	45	86
Capital expenditures	11,462	18,446	123	83
Total, cash expenses and capital replacement	53,439	94,188	574	428
Net cash returns	-7,234	1,314	-78	3
Source: Farm Costs and Returns Survey data				



Table 3-19 shows cow-calf production cash costs and returns for the average permittee and nonpermittee in the 10 western and Great Plains states for 1990. The 1990 data reveal that the average permittee operation with 221 cows had cash receipts of \$95,502. Total cash expenses were \$75,742, and capital expenditures were \$18,446, which yields net cash returns of \$1,314. BLM and Forest Service grazing fee expenses represent about 3 percent of total cash costs.

Average per-cow costs and receipts for permittees are significantly lower than for nonpermittees. An estimate of the cost differential between permittees and nonpermittees suggests that nonpermittee costs were almost \$105 per cow higher than permittee costs. Estimated permittee receipts were \$65 lower than nonpermittee receipts.

Permittees spent more per cow for breeding stock, fences, and hired labor than nonpermittees. Nonpermittees spent more per cow overall for capital items, mainly because of increased expenditures for machinery, buildings, equipment, feed, pasture rental, purchased stocker cattle, and most other variable and fixed cash costs.

Nonpermittees purchased 10 times more feeder cattle than did permittees. This greater involvement in purchased feeder cattle by nonpermittees would by itself increase per cow costs. But on a per hundred weight basis, permittees costs were \$10 per hundred weight lower than nonpermittee costs, and receipts per hundred weight were slightly higher for permittees.

Table 3-20 shows the costs and returns of a cross-section of sample permittee ranch operations at four different herd sizes and four levels of dependency.

The 1990 Farm Costs and Returns Survey data shows that cash returns (revenues minus cash costs) are positive for operators at all benchmark levels of herd size and dependency on public forage. The amount of public forage provided by BLM and the Forest Service varies from an average of 10.9 percent to an average of 85 percent for the most dependent operation. Appendix G, Economic Aspects of Supply and Demand for Livestock Forage on Public Lands, gives more information on the survey data and income characteristics of the ranch operations depicted in this section.

## Permit Value

As a general rule, all else being equal, a ranch with a federal grazing permit is worth more than a ranch without a permit. A value associated with a federal grazing permit is considered in the purchase and sale of ranch property. However, the issue of permit value must be viewed in relation to two important legal concepts.

The first concept involves the transferability of grazing permits. When a ranch property with a BLM permit is sold, the permit is transferred to the new base property owner after the transferee files a transfer application, applies for a permit, and it is determined that the new base

**Table 3-20: Cow-Calf Costs and Returns for Western State Permitted Ranches**

	Percent Dependency on Federal Forage			
	Average (36%)	Low (10.9%)	Medium (43.8%)	High (85.0%)
Herd Size (Number of Cows)	221	308	217	93
Ranch Revenue	\$ 95,502	\$ 153,313	\$ 94,178	\$ 37,705
Revenue per Cow	\$ 431	\$ 498	\$ 434	\$ 405
Ranch Cash Costs	\$ 75,742	\$ 108,616	\$ 82,718	\$ 29,333
Returns after Cash Costs	\$ 19,760	\$ 44,697	\$ 11,460	\$ 8,372
Returns per Cow	\$ 86	\$ 145	\$ 53	\$ 90

Source: USDA Farm Costs And Returns Survey (See Appendix G, Economic Aspects of Supply and Demand for Livestock Forage on Public Lands.)



property owner meets regulatory requirements and accepts the terms and conditions of the permit. Forest Service procedures are similar to those of the BLM. The sellers of base ranch property give up their permit to the government, which in turn may issue a new permit to the buyer of the base ranch property, if the buyer meets all requirements for holding a grazing permit. Hence, the issuance of grazing permits creates no right, title, or interest in federal lands or resources, and a permittee can not expect to transfer a specific grazing right to another private party, even as part of a conveyance of base ranch property.

The second concept involves fluctuations in ranch value due to changes of the grazing permit. Because the value of grazing permits has been associated with the privilege to graze on federal lands, permit changes that may reduce the overall value of a ranch have not been compensable. Otherwise, the Federal Government would have to reimburse permittees for value added to a ranch due to a federal benefit.

The Taylor Grazing Act, the Federal Land Policy and Management Act, grazing regulations, and case law, have consistently held that issuance of a grazing permit does not create any right, title, interest, or estate in the public lands or resources. Recognition of permit value by the federal land management agencies would allow permittees to retain the capitalized value of a public resource in their hands, a resource that has never been conveyed by the public to the permittees. Despite this, public land ranchers, bankers, and economists have asserted that a grazing permit attaches value to the base property in the context of a sale or loan value of a base property. In addition, the Internal Revenue Service considers the value of permits when property is transferred (Torell and Doll 1991).

In theory, the value of a permit at least partially reflects the capitalized difference between the grazing fee and the competitive market rate that could be charged for federal forage (Forest Service and BLM 1993a). Thus, raising the federal grazing fee to its economic value to the permittee or to a competitive market rate could change the benefit of the privilege to graze on federal land and reduce or eliminate the "value" of the permit. Altering the terms of the permit, such as the length of permit or the number of AUMs authorized, may also have this affect.

As stated in the Draft Incentive-Based Grazing Fee System report, and supported in other

research, the theoretical linkage between grazing fees and permit value has not been widely observed on an empirical basis (Forest Service and BLM 1993a). Jensen and Thomas (1967) found that factors associated with grazing cattle on public lands explained only 55 percent of the variation in permit value. Similarly, Torell and Doll (1991) found that permit values have not provided a consistent estimate of the value of public land forage.

After public land grazing fees increased from \$0.33/AUM to a base value of \$1.23/AUM in the 1960s, permit values continued to increase, supporting the notion that permit values may be influenced by a variety of market forces. Torell and Doll (1991) discovered as grazing fees on New Mexico state trust lands increased, capital values of state grazing leases decreased. Yet, the lease value for New Mexico state trust land has now increased to levels comparable with BLM and Forest Service permit values.

The 1983 appraisal found permit values ranging from an average of \$140 per head month in Nebraska to \$40 per head month in Nevada (Forest Service and BLM 1986). The incentive-based grazing fee analysis found that New Mexico, Wyoming, and Idaho's average permit values range from \$36 per AUM for BLM permits in Wyoming to \$89 per AUM for BLM permits in New Mexico. BLM and Forest Service permits significantly differed in Wyoming but not in New Mexico or Idaho (Forest Service and BLM 1993a).

## Grazing Fee Receipts and Payments

Permittees are charged for federal rangeland grazing use according to the number of AUMs of forage they are authorized to use. The grazing fee receipts collected from permittees are later distributed according to legislative requirements to the following: agency Range Betterment Funds, states and counties, and the U.S. Treasury. The amounts distributed to each entity differs because of different legislative authorities.

Grazing fees collected by BLM are distributed under Section 3 (grazing permits) of the Taylor Grazing Act of 1934 as follows: 50 percent to the Range Improvement Fund to be appropriated the following year, 12.5 percent to



appropriated the following year, 12.5 percent to the states where the fees were collected, and 37.5 percent to the U.S. Treasury. Under Section 15 (grazing leases) of the Taylor Grazing Act, 50 percent of the fees are distributed to the Range Improvement Fund and 50 percent are returned to each state where the fees were collected. As a matter of policy, monies from the Range Improvement Fund are returned to the BLM district where they were collected. (See Figure 3-8, Distribution of Grazing Fee Receipts: BLM.)

On National Forest System lands, grazing fee receipts are distributed as follows: 50 percent to the Range Betterment Fund to be appropriated the following year, 25 percent to the states for distribution to the county of origin for roads and schools, and 25 percent to the U.S. Treasury. Half of the funds in the Range Betterment Fund are returned to the Forest Service region of origin, and half are returned to the forest of origin. (See Figure 3-9 Distribution of Grazing Fee Receipts: Forest Service). On the Forest Service-administered national grasslands grazing fee receipts are allocated as follows: up to 50

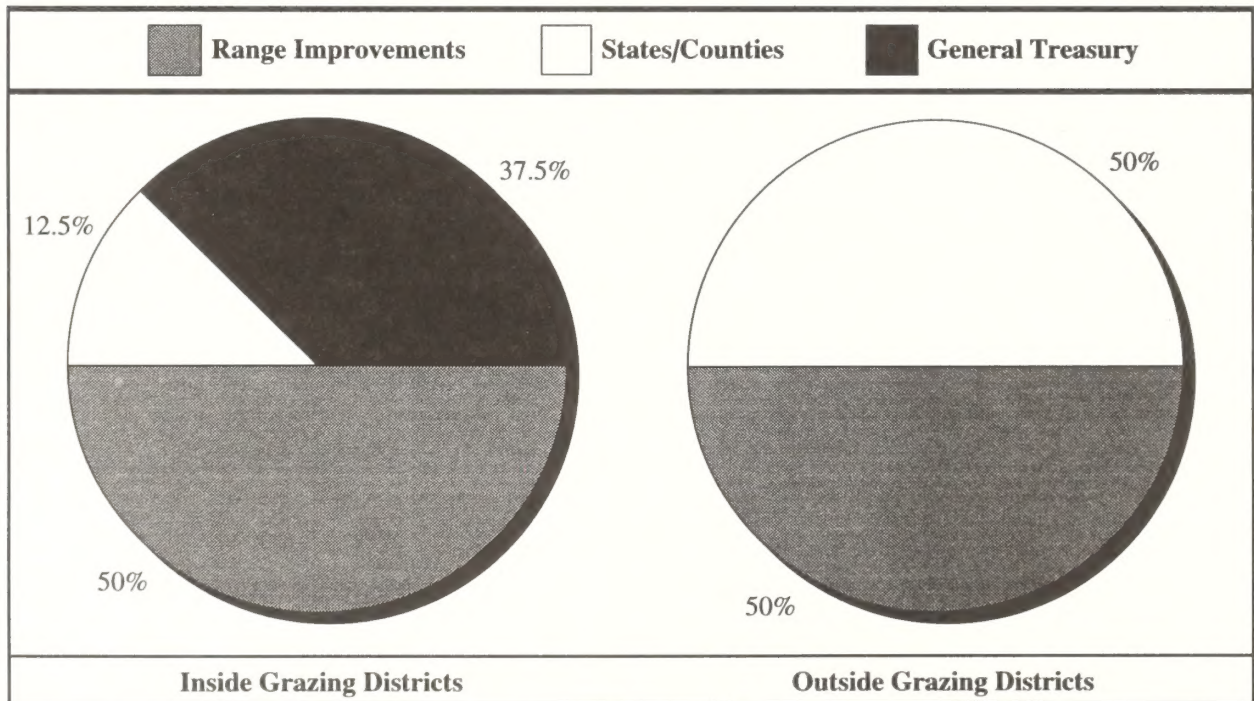
percent of fee can be waived if the permittee or grazing association will be making rangeland improvements, 12.5 percent to the states for distribution to the county of origin for roads and schools, and 37.5 percent to the U.S. Treasury. (See Figure 3-9, Distribution of Grazing Fee Receipts: Forest Service.)

BLM grazing fee receipts totalled \$17.4 million in fiscal year 1993 (October 1, 1992 through September 30, 1993). Forest Service grazing fee receipts totalled \$10.7 million in calendar year 1991, the most recent year for which data has been completely collected. (Forest Service receipts do not include Oklahoma and Texas). Grazing fee receipts collected by BLM and the Forest Service totalled \$28.1 million. Table 3-21 shows the distribution of grazing fee receipts by category for agencies.

### Payments-in-Lieu-of-Taxes (PILT)

Under the Payments-in-Lieu-of-Taxes Act of 1976 (the PILT Act), Congress pays local units of

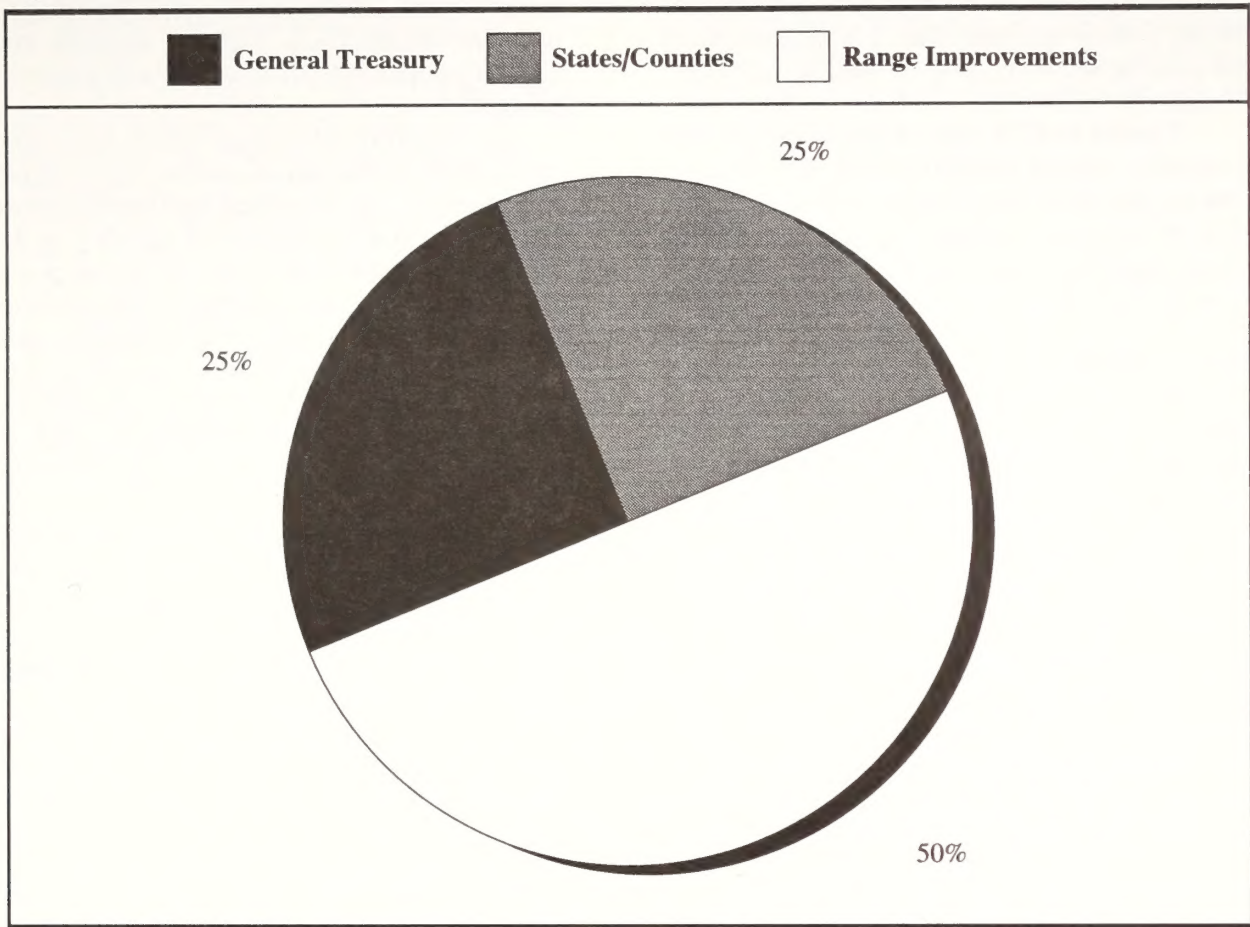
Figure 3-8: Distribution of Grazing Fee Receipts: BLM







**Figure 3-9:** Distribution of Grazing Fee Receipts: Forest Service



**Table 3-21:** Distribution of Grazing Fee Receipts

	BLM	Forest Service	Total
Range Betterment Fund	\$ 8,685,000	\$ 5,359,000	\$ 14,044,000
Payments To States And Counties	\$ 3,216,000	\$ 2,680,000	\$ 5,896,000
U.S. Treasury	\$ 5,492,000	\$ 2,680,000	\$ 8,172,000
<b>Totals</b>	<b>\$ 17,393,000</b>	<b>\$ 10,719,000</b>	<b>\$ 28,112,000</b>

Source: BLM 1993e; Forest Service 1993d



them for reduced local property tax base resulting from the presence of certain federal lands. The PILT payments are meant to supplement other federal revenue-sharing payments—such as grazing fee receipts—received by local governments.

A county's PILT may be calculated by two methods, but the amount paid to the county is the higher value under either calculation, subject to payment ceilings. A county's population, amount of federal entitlement acres, and certain payments made to the state and county by the Federal Government are the variables that determine which method would yield the higher payment to the county. Depending under which formula a county's PILT falls, increases in grazing fee receipts could cause a corresponding decrease in PILT. (The reverse is also true.)

A more detailed description of the relationship of PILT to grazing fee receipts is contained in Appendix H, Payments in Lieu of Taxes.

## ***Social Conditions***

The Social Conditions section focuses on the general attitudes, beliefs, values, and social well-being of the affected public, selected western counties, and some national perspectives. Because the affected public is large, it was divided into three groups: ranchers, recreationists and individuals, and people concerned about the environment. The Ranchers subsection was written to review how ranchers are directly and immediately affected by changes in rangeland management. Individuals within most groups or communities have various, often opposing, opinions about the issues on rangeland management.

## **Demographic and Social Trends in the West**

In 1990, the population in the 17 western states was 76,650,728. California has the largest population with more than 29 million. North Dakota, South Dakota, Wyoming, and Montana each had fewer than a million people. Population densities vary from less than 5 people per square mile in Wyoming to nearly 200 people per square mile in California. The percent of the total population in rural areas varies from 47 percent in Montana to 8 percent in Califor-

nia. Though the total 17-state population grew by 20 percent between 1980 and 1990, individual states varied. North Dakota and Wyoming's population declined, whereas Arizona and Nevada's population increased by more than 35 percent.

In the rural West, population and social trends tend to respond to unique issues. Many rural areas are experiencing a significant increase in population after decades of stability or decline. Other rural areas continue to lose population due in part to the outmigration of young people who leave for advanced education, military service, and employment. In addition to the above trends, some rural areas are subject to the population and employment boom and bust cycles of oil and gas and other mineral development.

The West also has major cities, such as Denver, Phoenix, Portland and Seattle, that have experienced significant growth over the last few decades. Serving as headquarters for environmental groups, these cities have many residents that are concerned about the environment.

The movement of people and jobs into some rural areas began in the 1970s and is expected to continue into the 21st century. The migration turnaround reflects a reversal of the rural-to-urban migration pattern in most of the U.S. before the 1970s. Intermountain valleys, such as Steamboat Springs, Colorado; Salmon, Idaho; and Missoula, Montana, typically experience immigration. In scenic areas, particularly those suitable for recreation, ranches are being sold for recreation uses or subdivided for homes. Some immigrants buy small lots to ranch or farm but do not depend on an economic return from the lot. Western rural areas are moving from a long-term economic dependence on agriculture or mining to recreation and tourism. The population immigration has mixed rural and urban values and increased contacts between rural natives and exurbanites whose beliefs and values challenge the existing ways of life. Rural natives may feel they have lost control of their community, making it a less desirable place for them to live.

Other rural areas have continued to lose residents in the last decade. These communities may be having difficulty maintaining their local businesses and such services as schools and health care. Residents are concerned about the economic survival of their communities and the preserving their current lifestyle. The economic



survival of these communities and ranching families may depend on how well they diversify to compete in the 1990s and beyond.

In some areas, ranching families are diversifying their income by offering tourist-related attractions, including bed and breakfasts, trail rides, livestock drives, guided wildlife tours, and working dude ranches. Others can stay on their land because family members work in jobs outside the family ranching business to supplement their ranch income.

Another important trend is the increasing popularity of the West for recreation. The demand for the types of activities most available on federal lands is growing faster than for other activities (Forest Service 1989a). These activities include downhill and cross-country skiing, backpacking, visiting prehistoric sites, and day hiking. Many western communities have problems maintaining access to private and federal land if access through closed private lands is required for recreation. Access is often prevented if ranches are purchased for recreation and recreation homesites; ranchers lease their land to outfitters and close it to others; or ranchers are attempting to avoid vandalism, litter, or open gates.

## Ranchers

The values, attitudes, and beliefs that ranchers have developed and incorporated into their social structures and self-images should be recognized to understand how Rangeland Reform '94 could affect ranchers. This section discusses some of those social characteristics, first from a qualitative perspective and then from a quantitative perspective. Ranching has a variety of characteristics, depending on factors such as location, the number and type of livestock, management, distance from the nearest community, and financial structure.

Fowler and others (1993) published research on 4,336 ranchers in 11 western states. Although their research does not represent all ranches with federal permits, it generally describes the ranching lifestyle, employment, and rancher interactions with the western public. The ranchers surveyed were members of livestock producer organizations, and nearly 11 percent of all federal permittees, who accounted for 35 percent of all federal allocated forage. The respondents represented a broad range of ranch size categories. Twenty-six percent of the respondents had herd

sizes of less than 100; 42 percent had herds of from 100 to 350; 24 percent had herds of from 351 to 1,000; and 7 percent had herds larger than 1000. In a comparison of herd size data to other data, operations with the largest herd size and most AUMs appear to be overrepresented.

Ranching is a way of life for many respondents. The average respondent was 55 years-old and worked on the same ranch for 31 years. At the time of the research, the average ranching family had been in the business for 78 years and in the same state for 68 years.

The average ranch had nearly seven people associated with it, not including children. An average of two of the seven people were unpaid family members, and another family member worked off the ranch, contributing an average of 23 percent of the household income. The range of family members working off the ranch was from Montana's average of less than one person—who contributed 11 percent of household income—to Arizona's average of two people, who contributed 53 percent of household income. These responses reflect the growing dependence on off-the-ranch income. Many ranches, especially small ones, would not remain economically viable without off-the-ranch income.

Respondents estimated that they spend about \$19,000 annually in local communities, showing that some local businesses depend on ranchers.

Respondents reported that they spend an average of 9 days in land planning meetings annually. They also said that the public visits federal allotments an average of 950 times annually for recreation.

When asked about what they would do if livestock grazing were prohibited on federal land, 57 percent said they would operate on a smaller scale, 18 percent said they would retire, 9 percent said they would move out of state, 16 percent said they would begin a new occupation, and 21 percent said they would convert their land into real estate development.

- Idaho, California, Washington, and Wyoming reported the highest percentage of ranchers who would operate on a smaller scale; Arizona and Montana reported the lowest.
- Over one-third of the respondents in Arizona, California, and Colorado re-



ported that they would convert their land into real estate; less than one-tenth of Montana's respondents agreed.

A survey conducted by Saltiel (1991) provides information on the attitudes of 1,084 Montana farmers and ranchers toward grazing fees. Sixty-seven of the respondents opposed raising grazing fees, and 85 percent said increased grazing fees would harm them. But 56 percent of the ranchers without federal permits favored raising grazing fees. Nearly two-thirds of ranchers without federal permits said that a fee increase would not affect them, while 10 percent said that a fee increase would benefit them. A key point of Saltiel's survey is that most western ranchers do not have federal grazing permits and would not be affected by an increase in grazing fees.

Qualitative descriptions give us a better perspective on lifestyles, attitudes, values, and beliefs. The remainder of this section describes these factors. Some of the discussion on attitudes is based on comments from ranchers and livestock grazing associations about Rangeland Reform '94.

Whether they are American Indian, Hispanic, Anglo, or other races, ranchers tend to share many social characteristics. According to Simpson (1975), ranchers perceive themselves as personifying traits such as fair play, honesty, and independence. They believe they are rugged and enduring individuals who are not afraid of hard work. They take great pride in being independent but willingly work to help neighbors when the need arises. Many Americans also hold similar perceptions about these rancher characteristics.

But as Jobes (1986) notes, "Outsiders . . . confuse the style, or image that they perceive with the underlying structure. Ranchers err because as they participate in the myth, they fail to understand the inconsistencies between what they believe and what they do." Some of the personal traits and lifestyle patterns of cowboys/ranchers have been romanticized and may tend to exist less in reality than in the minds of ranchers and other Americans.

According to Jobes (1986), ranchers like to maintain control of their world on an individual basis. They would avoid selling their ranches, regardless of lost income, to keep a sense of success and their lifestyle. And their remorse would involve more than retiring from a job.

Other researchers also found that ranchers are unhappy about outsiders exerting control over their operations. Emmerich and others (1992) conducted an in-depth interview with the Pearce family, which has owned and operated the T Quarter Circle Ranch in northern Nevada since 1913. The family was under stress and concerned about ranches having to deal with influence from government agencies and other federal land users. Family members wanted to manage their allotments in a wise and sustainable manner and knew they had to work with federal, state, and county governments and other organizations to do so. The researchers found the Pearce family somewhat stressed because of its independent nature and desire to be self-sufficient.

The ranching community is living in a socially contentious setting. Cool (1992) pointed out the prevalence of current slogans such as "Cattle free by '93" and the countering statement by cattlemen of "Cows galore in '94" as typifying the conflicting nature of today's setting. The romantic notion that cowboys love a good fight just adds to the stress felt by ranchers. Some ranchers have made innovative changes in their operations to deal with growing stress.

Most ranchers face increasingly stressful social situations as they try to balance their traditional lifestyles with demands from environmentalists and recreationists. Ranchers commented during the Rangeland Reform '94 scoping period about their concern for social and economic impacts to individual ranches and local communities. They are concerned about the whether they can continue local ranching customs and culture. They believe Rangeland Reform '94, combined with other natural resource policies, will eliminate livestock grazing on federal lands. Ranchers said the new policies will damage the relationships between federal land management agencies and westerners.

Ranchers said they already have a slim profit margin and that higher grazing fees will cause economic hardship. Furthermore, loans may be harder to obtain, and they will be forced to lay off employees, abandon leases, or subdivide their land. Ranchers believe that the overall consequences of Rangeland Reform '94 would be harm to their regional economies from ranch bankruptcies or sales, and a decreasing value of recreation and tourism (as influenced by ranching traditions and open space).



Ranchers believe that livestock grazing on federal land is vital to the economic stability of rural communities. Effects to small communities include decreased patronage and possible closings of small businesses, less funding for county and state schools and health care, and increased pressure on social services to assist the unemployed and poverty stricken and to train rural residents for new careers and lifestyle options.

## Counties and Communities

Rural communities are facing many challenges. Residents of rural areas believe they are engaged in a struggle to maintain control of their community's character rather than to control the frontier as in the past. Many groups want the traditional rural character: newcomers, old time ranchers, and communities that are losing residents or gaining residents but losing their rural character. For example, in Gunnison County, Colorado, the County Stockgrowers Association has joined forces with the High Country Citizens' Alliance to control their community's growth characteristics.

This section describes three communities, (one is hypothetical) that are good examples of the communities near federal rangelands. The hypothetical community depends on agriculture and federal grazing and has been losing residents since the 1970s. Eastern Montana, Wyoming, and Colorado have many examples of this type of community. For instance, nearly 60 percent of Montana's 56 counties lost more than 3 percent of their population between 1980 and 1990.

The other two communities are Gunnison, Colorado, and Rawlins, Wyoming. Gunnison County Colorado is an example of a rural area that has experienced the immigration of exurbanites and recreation development typical of many intermountain valleys in the West. Rawlins and its surrounding Carbon County have been historically associated with ranching and mining. Low immigration of exurbanites and recreation development has been experienced in this area.

These descriptions provide a basis for the analysis of community effects associated with the alternative proposals being considered in this EIS.

## A Typical Small County and Community

This is a hypothetical example of typical small counties and communities in the West. The information is based on interviews completed for two of BLM's recent environmental impact statements (BLM 1992j and BLM 1993a).

A sparsely settled, isolated area on the high plains, the county was settled in the late 1880s as the railroad brought in new settlers. Ranching soon became and has remained the most important economic activity. Historically, population declines have been due to drought, mechanization, and the trend toward larger ranches. This county has not experienced the economic diversification of mineral, resort, or other development experienced by many other rural western areas.

The county's population has declined steadily since 1940. Its 1990 population of 1,200 was 20 percent less than its 1980 population. The county has one incorporated community, the county seat, which had 700 residents in 1990, a decline of 15 percent since 1980. The county and community population declines are projected to continue into the 21st century. Residents believe the area is a good place to live and meets their personal needs. The qualities residents like the most are the friendly people, the small close-knit community, the uncrowded area with natural beauty and wide open spaces, the unhurried lifestyle, and the plentiful hunting and fishing opportunities. Residents believe their community is an excellent place to raise children.

Ranchers are well integrated into the community. They play major leadership roles and participate in community activities. Some ranchers live in town part of the year because their children attend the county high school there and it is difficult to drive into town daily in the winter.

Area residents are highly concerned about their community's economic survival and the preservation of their current lifestyle. Whole families have left the area because they lack alternative employment if their ranch or business fails. The population loss has been followed by more business losses, resulting in a decreasing tax base to support local services. Resident concerns about the future include loss of jobs, popu-



lation, funding for community services, and the high demand for geriatric services.

Area residents are actively pursuing economic development related to recreation but have not been successful because of the small population base, limited access to capital, and distance from transportation networks and other recreation attractions. To date, most recreationists from outside the local area come in the fall to hunt.

Some ranching families are diversifying their income by offering tourist-related attractions such as outfitting for hunters and working ranch experiences. Others supplement their income by obtaining employment outside their ranching business.

All residents, not just ranchers, believe that ranching is important. Livestock grazing is viewed as the most important and most threatened use of federal land. A major concern residents have is change being forced on them from outsiders, with pressure to reduce livestock grazing. Residents believe that the Federal Government should consider social and economic impacts to local communities when making land use decisions.

## Carbon County, Wyoming

This discussion was developed from information provided by the Carbon County 2000 Project (Worthington, Lenhart and Carpenter, Inc. 1993a; 1993b; 1993c), the Wyoming Community Assessment Program, the *Green River-Hams Fork EIS Round 1* (BLM 1980b), the *Seven Lakes Grazing EIS* (BLM 1978), and interviews with area residents.

Carbon County developed and its population grew as the railroad entered the area. The railroad stimulated industries such as mining, sheep and cattle ranching, and timber harvesting. The route for the railroad was designed to support the county's potential coal industry. Carbon County experienced a 64 percent increase in population in the 1980s due to developed uranium, coal, and oil and gas industries. Between 1980 and 1990, the population declined by 24 percent to 16,659 as employment in mining industries declined. Rawlins, the county seat, has the largest community with a population of 9,380 in 1990.

Carbon County ranchers value independence and mutual neighborliness and believe

they have the right to control federal land, with or without the Federal Government. They are concerned that their ranching lifestyles will be lost under potential federal policies. They believe that the Federal Government is not concerned about local problems and that multiple use management, including livestock grazing, is needed on federal land to supply regional and national markets and maintain the area's economy. The townspeople generally share the same values as rural residents.

Most ranch families financially depend solely upon their ranches. Some ranchers offer hunting and guide services, and a few offer working dude ranch experiences. When the mines needed workers, more families supplemented their ranch incomes with off-ranch employment.

A few ranches in southern Carbon County have been purchased by people from other counties for recreational purposes. More recently, people have moved into the area and lived on ranches they have purchased. Some people from other states have bought local ranches but have not subdivided them. Recreation is important to local residents and people from outside the area, mainly Coloradans, who come to hunt, fish, and camp.

Rawlins has diverse employment associated with BLM, mining, the railroad, a prison, and a refinery. Agriculture is considered important and is viewed as one of the more stable industries in the area. Some of Carbon County's multiple-generation ranch families live in Rawlins. Describing Rawlins as a friendly community, residents love the area and its surrounding natural environment.

Even though the economy has improved slightly since the 1980s, Rawlins residents are concerned about the number of businesses that left during the 1980s and the effect of the declining tax base on town and county services and infrastructure. Residents want diverse businesses and a stable economy. A master plan is in progress for redeveloping the downtown area. Groups are working to attract visitors by emphasizing their town's historical, archeological, and geological features. Carbon County also has a grant to aid in diversifying the economic base of its communities, especially those likely to be economically affected by federal or private sector land management decisions. Changes in federal land management practices are of



particular concern since more than half of the county consists of federal land scattered within private land.

Community and rural residents are concerned about the future of agriculture and the effects of reforming rangeland management. A local multiple-use group, the Carbon County Coalition, was formed in 1991 to address concerns about the county and community economy, the public's misunderstanding of the ranching industry, and other issues. The coalition's members are associated with recreation, minerals, environmental concerns, timber, banking, ranching, wildlife, and other fields.

The coalition believes many demands for reforming rangeland management have been met in Carbon County and that the public mistakenly believes that the rangeland is in poor condition and cannot be easily persuaded otherwise. The coalition also believes that grazing fees should be set locally according to rangeland conditions. Their concerns about reforming rangeland management include the following.

- Small producers will be unable to maintain their operations with a grazing fee increase.
- As ranchers go out of business, their land will be subdivided and homes will be built in sensitive areas such as riparian zones.
- More fencing will be required if ranchers choose not to use federal lands in checkerboarded areas (areas of mixed land ownership in a checkerboard pattern) and as land is subdivided for homes (and the fencing will hamper wildlife migration).
- Subleasing regulations.
- Loans will be more difficult to obtain.
- Loss of land stewardship with increases in out-of-area ownership will lead to frequent changes in land ownership.

### **Gunnison County, Colorado**

Historically, Gunnison County's economy has depended on mining, ranching, and tour-

ism. A silver boom in 1879 brought many miners to the area, and when the silver began to play out in the early 1880s, many people who had supplied the miners turned to ranching. As ranching was developing in the area, large coal mines were also drawing many people to the county, especially to Crested Butte and its surroundings. Coal mining, which began around 1880, was significantly reduced in 1952, causing high unemployment and outmigration. The 1950s and early 1960s were difficult for many residents due to the 1952 mine closures and the withdrawal of the railroad in 1955.

The county's economy improved when the Bureau of Reclamation built three dams on the Gunnison River between 1965 and 1972. Increasing tourism and the establishing a ski resort at Crested Butte also contributed to the county's stability (Vandenbusche 1993).

Besides the ski resorts, other sources of recreation include Maroon Belles and Collegiate Peaks, two wilderness areas in the Gunnison County. The Black Canyon of the Gunnison is one of the Nation's more scenic areas. The Gunnison River's upper reaches are reputed to be among the top fly fishing streams in the U.S. The largest body of water in Colorado, Blue Mesa Reservoir, offers fishing, water skiing, jet skiing, and boating.

Gunnison County's population grew by more than 40 percent between 1970 and 1980, followed by a decline of 4 percent between 1980 and 1990. Most of the new residents are California immigrants. Many are white-collar professionals who can buy 40 acres and a \$150,000 house and want the county's quality of life. Some see the area as their seasonal home. Since 1990, tourism and recreation industries increased the county's population and employment.

In addition to California immigrants, rural counties of the Colorado Plateau are also experiencing recreation-related growth as residents of bigger cities within the area seek to get away from some of the features of city life (Westbay 1993). Recently Gunnison County has grown mostly in Crested Butte and Mt. Crested Butte, somewhat as a result of skiing. Crested Butte, however, does not depend on skiing as much as Mt. Crested Butte. Neither town strongly depends on ranching (Hess 1993).

Businesses in the town of Gunnison have supplied area ranchers for nearly 100 years. Ranchers are socially, politically, and economically important to the community. Some ranch-



ers with smaller operations supplement ranch income by working at other jobs in local communities. Residents believe that ranchers play a vital role in preserving the area's open spaces and thus its high scenic quality. When ranchers sell their operations, many residents feel sad that the area is becoming urban. Most residents want the ranching lifestyle to survive (Westbay 1993).

Gunnison County residents hold strong opinions on a variety of current issues. A citizen's coalition is pushing for a growth moratorium in the county because they are concerned about the rate of growth and the subdivisions that have been developed. Other residents view growth as beneficial because they depend on construction or tourism for their livelihood.

In general, though, the community supports ranching. Most ranchers have good relationships with recreationists and with those interested in protecting wildlife (Westbay 1993). Some ranchers even maintain biking and hiking trails that cross their base properties so that they are more usable by recreationists.

A coalition of ranchers and environmentalists has formed in Gunnison County to address rangeland reform issues. The coalition includes members of the High Country Citizens' Alliance and the Gunnison County Stockgrowers Association. The coalition has developed and submitted a proposal for grazing reform, which addresses the concerns of both groups.

Permittees in Gunnison County are increasingly asking why they are being targeted for increased regulation of their activities. From their perspective, developments that affect water quality most affect ecosystems. Many ranchers believe that federal agencies are not regulating developments and recreation as aggressively as livestock grazing. Because of the unsettled condition surrounding the grazing issues, ranchers are concerned about the future quality of their lifestyle, especially as some ranches continue to be sold and subdivided into small parcels (Spahn 1993).

## National Attitudes

Rangeland Reform '94 is just one aspect of a broader debate on environmental issues and resource management in the U.S. and around the world. According to the Forest Ecosystem Management Assessment Team (1993), "This

growing concern with the environment, from the international to local levels, appears linked to some fundamental structural changes taking place in industrialized societies. Shifts in education levels, population distribution, and composition and make-up of the labor force all combine to bring increased concern with issues related to the quality of life and other types of personal attitudes, including natural resources and the environment."

According to Stankey and Clark (1991), social values for lands and natural resources take many forms:

- Commodity values: timber, rangeland forage, minerals
- Amenity values: lifestyle, scenery, wildlife, nature
- Environmental quality values: air, water quality
- Ecological values: habitat conservation, sustainability, threatened and endangered species, biodiversity
- Public use values: subsistence, recreation, tourism
- Spiritual values: sacred places

In the past, natural resource management emphasized commodities. The emerging interests in other values has forced a reevaluation of old management practices. Stankey and Clark's (1991) report states, "A new focus on the part of the public involves a shift from commodities and services to environments and habitats. The public is much more concerned about forests as ecosystems than they have been previously and is more concerned with having access to decisions about them."

A national study of attitudes toward rangeland management (Steel and Brunson 1993) included a random survey of more than 1,300 adults nationwide, asking about attitudes toward federal land management of livestock grazing and a variety of related issues. In this study, two-thirds of the respondents said that ranchers should pay more to graze their livestock on federal rangelands; 14 percent of the respondents disagreed. Twenty-five percent of the respon-



dents said that federal rangeland management should emphasize livestock grazing; 43 percent disagreed. More than a third of the respondents agreed that livestock grazing should be banned on federal land; 21 percent disagreed. At least 75 percent of the respondents said that wildlife should be better protected (86 percent), fish (76 percent), and rare plant communities (75 percent) on rangelands. About 40 percent of respondents said that the economic vitality of local communities should be given the highest priority when making decisions about federal rangelands; a similar proportion disagreed.

Responses from people living in the eastern and western parts of the U.S. were similar. Westerners (29 percent) were slightly more likely than easterners (23 percent) to believe that federal rangeland management should emphasize livestock grazing. Unexpectedly, western respondents were likely to disagree with the statement that the economic vitality of local communities should be given the highest priority when making decisions about federal rangelands (46 percent versus 37 percent for easterners). Families depending on farming or ranching for income were likely to favor current rangeland practices.

Dalecki and Coughenour (1992) found national, widespread support for traditional agrarian values. In a national sample of adults, they found the following beliefs to be strongly supported by rural and urban populations: family based agricultural operations are very valuable, agricultural lifestyles are natural and good, and the self-reliance associated with agriculture is important.

Ranchers are concerned that people who have no experience or thorough knowledge of the local areas are the ones pushing to change rangeland management.

Rural and urban attitudes differ. The Report of the Forest Ecosystem Management Assessment Team (1993) concluded, "In general, rural residents are more likely to support commodity-based management of federal forests while those in urban areas are more likely to support ecosystem-based management." But the same document also suggested that a diversity of values toward natural resource issues is found among residents of rural and urban areas. These conclusions are probably also true of attitudes toward rangeland management.

## Public Interest Groups

The group of Americans potentially affected by Rangeland Reform '94 is large and decentralized. In this analysis the public has been classed into three groups: ranchers, recreationists, and environmentalists.

Though recreationists may be less directly affected than permittees, effects have been documented. Research on the effects of participation in outdoor recreation show such benefits as improved physical and mental health, increased self-esteem, and an enhanced sense of well-being and spiritual growth. Participation in outdoor activities can also increase family interaction and foster cohesion. Benefits to communities include increased social solidarity, satisfaction with community life, and increased ethnic and cultural understanding (Forest Service 1989b).

The same report (Forest Service 1989b) also states that some of the major issues facing recreation today include protecting resources and open space, acquiring more land and water to meet anticipated demand, resolving conflicts among diverse users, and addressing the need for more access to outdoor recreation areas.

During the scoping period, environmental groups said that they support steps to improve rangeland. Attitudes of these groups differ. Some support Rangeland Reform '94. Others believe that Rangeland Reform does not go far enough. These groups suggest ways to correct abuses of the past and gaps in the new proposal where grazing should be allowed. They stress that fragile or damaged rangelands, as well as lands with values reduced by the presence of livestock, should be declared off limits to grazing.

Environmental groups said that the economics of ranching is less important than the ecology of ranching. They believe the grazing fee system used for federal lands does not account for all costs to public resources, undervalues the grazing privilege in relation to local fair market value, and tends to encourage overemphasis of grazing programs at the expense of other legitimate federal land uses. These groups said the protection and restoration of native plants and animals and riparian areas should be most important and guide management decisions.



Groups and people with environmental concerns generally support the elimination of grazing advisory boards. They believe resource advisory councils would provide better opportunities for the public to voice opinions.

These groups support the development of standards and guidelines. But they voice concern that without means for enforcement and implementation, the standards and guidelines would be worthless. They said regulations are needed that force action. Some favor the No Grazing alternative simply because they do not trust BLM to administer livestock grazing in a sound ecological manner.

With a variety of interests, such as snowmobiling, hiking, and hunting, many recreationists believe that Rangeland Reform '94 would benefit the recreation industry and create economic growth with business opportunities, employment, and income for local communities. They also believe that Rangeland Reform would enhance other industries, such as commercial fishing, by improving aquatic habitats. Some recreationists, however, do not believe that rangeland management needs to be reformed.

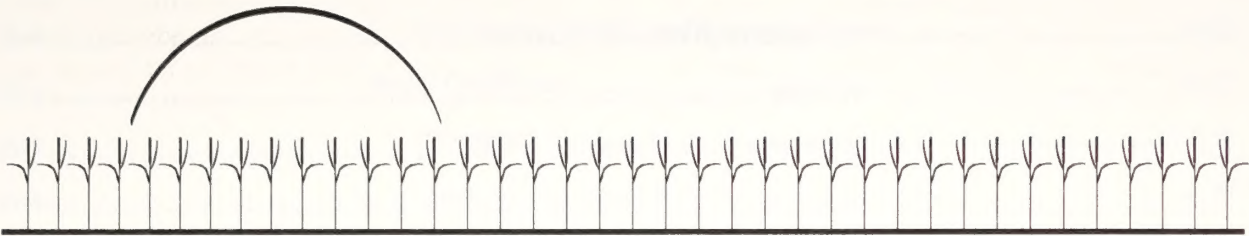
For example, some recreationists want to see grazing advisory boards abolished and prefer resource advisory councils to ensure represen-

tation from the local recreationists. Other recreationists believe grazing advisory boards should remain unchanged to let people who understand the direct impacts to the livestock industry make recommendations to BLM.

Most recreationists support Rangeland Reform '94. But some want stricter policies by urging reduction or complete removal of grazing privileges on lands that are fragile and damaged. Recreationists who want cattle removed from federal rangeland believe cattle are destructive, the byproducts of grazing are disturbing, and the fees do not cover damage to federal land. Generally, recreationists living closer to the communities affected by federal land management decisions have less extreme opinions on removing livestock from federal land.

Some recreationists believe grazing fees should be increased, while others do not since higher fees could put ranchers out of business and affect hunting privileges. One spokesman from a sportsmen's association stated, "Subdivisions could replace historic ranches, or wealthy people will buy the lands and no one will be allowed to use them. We depend on the ranchers, especially during low forage years, to feed a lot of wildlife. If you start putting these guys out of business, we could be in trouble."





# CHAPTER 4

## Environmental Consequences

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## Introduction

Chapter 4 describes effects on the human environment of the Proposed Action and other alternatives described in Chapter 2.

Environmental consequences can be categorized and presented in many ways. Some are the direct effect of implementing an action. Others are more indirect, occurring later or further away. Some tend to be short term. Others last longer. Some effects are adverse. Others are beneficial. Some are mainly physical or biological. Others are economic or social. This chapter discusses environmental consequences in all these ways.

The Proposed Action and alternatives analyzed in this chapter consist of many potential changes to rangeland policies, regulations, and grazing fee formulas. Many of these potential changes would be largely administrative and would have little *direct* effect on the environment. They are aimed at improving agency efficiency and effectiveness, increasing consistency within and between agencies, or meeting other nonenvironmental objectives or public policies. They would often, however, result in indirect or secondary effects on physical, biological, social, or economic aspects of the environment. Chapter 4 also discusses these types of effects.

## Cumulative Effects

The regulations for implementing the National Environmental Policy Act (NEPA) require federal agencies to analyze and disclose *cumulative* effects—effects that result from the incremental impact of an action “when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.” (40 CFR 1508.7)

The Proposed Action and alternatives are broad in scope. Each consists of many actions, including changes to BLM and Forest Service rangeland management policies, regulations, and the grazing fee formula. As a result, this EIS is programmatic, addressing environmental consequences that are correspondingly broad in scope. Furthermore, neither the Proposed Action nor the alternatives would be implemented

in a vacuum. Implementation would be interwoven with many other actions, events, and trends taking place at local, regional, national, and international levels. For example, actions on federally administered lands may have beneficial or harmful impacts to systems on private lands. The analysis in Chapter 4 strives to consider these changes.

For example, livestock grazing on federal lands is not the only factor that affects rangeland vegetation. Climate, recreation and wildlife use, management practices on adjoining lands, and the introduction and spread of alien weeds are also key considerations. The future of rangeland vegetation cannot be predicted by considering changes in livestock grazing management alone.

Similarly, BLM and Forest Service rangeland management policies and grazing fees are not the only factors that affect the western livestock industry and western rural communities. Also of major importance are regional population growth; changing demographics, lifestyles, property values, and agricultural subsidies; economic competition and restructuring; and changing laws, policies, and practices being implemented by other federal and state agencies.

Population growth and demographic changes in the West and in many western rural communities will continue to transform rural economies. Population growth in many rural communities, while contributing to economic growth and diversification, will continue to diminish the relative importance of agriculture in those communities. But economic diversification also offers more chances to earn off-ranch income and helps families maintain their ranches. Communities that continue to lose population and whose economies are in decline may be further strained by decreases in livestock production.

Land use changes, such as increased recreation use and subdivision of privately owned ranchlands, are both a cause and a result of trends in agriculture. Economically marginal ranches might be encouraged to sell to developers where the demand for rural homesites is increasing. As a result, agricultural production would further decline in such areas. Increased outfitter and guide activities, which encourage more recreational use of rural areas and offer more income-earning potential to ranches,



might contribute to population growth and in turn accelerate changes in land use away from agriculture.

Demographic and land use changes might increase or decrease a community's tax base. Where economies are stable or growing, the tax base would likely be stable. Where populations continue to decline or livestock production significantly declines, the tax revenues might continue to decline.

Changes in land use might accelerate the loss of access to federal land and access to and across private land. Reduced access might increase the demand for land adjustments (such as land exchanges) by BLM and the Forest Service to obtain more access to federal lands.

The elimination of the Federal Government's wool subsidy may accelerate the decline in sheep production in the West and might cause many sheep producers to sell their ranches. However, the demand for forage on public lands, national forest lands, and national grasslands is expected to remain constant in the long run. Other government policies, such as trade agreements aimed at reducing international trade barriers, would also affect the industry. The expiration of Conservation Reserve Program (CRP) contracts beginning in 1996 might encourage the use of croplands for pasture, thereby increasing the forage for livestock.

The protection and recovery of federally listed species and their habitats—for example, anadromous fisheries in the Pacific Northwest and desert tortoises in the Desert Southwest—are also likely to significantly change the way livestock grazing is managed on federal lands. Future activities designed to avert habitat loss and endangered species listings in the long term might help sustain livestock production.

Similarly, best management practices for livestock grazing—prompted by the need to comply with the Clean Water Act—are being developed and implemented in several western states and will also lead to important changes.

A fundamental assumption of this analysis is that, with or without BLM and Forest Service range reform, the demand and need for changes in rangeland management will continue. These changes are likely to result in declines in livestock use on federal lands over the long term.

## *Impacts Common to All Alternatives*

### *Air Quality*

The most significant impacts to air quality under all management alternatives for both agencies would result from vegetation management projects. Impacts could include smoke from prescribed burning; moderate increases in noise, dust, and exhaust from manual and mechanical vegetation treatment; and moderate noise and slight chemical drift from aerial herbicide spraying. Under prescribed burn plans particulate matter can be minimized and areas burned so that particulates will not affect populated areas. These impacts were described in detail in the BLM Vegetation Treatment EIS (BLM 1991a). Impacts would be temporary, small in scale, and dispersed throughout the West. Combined with standard management practices (stipulations), these factors would reduce the significance of potential impacts.

Potential air quality impacts are assessed before projects are implemented. To determine changes that might result from their proposals, the agencies review site-specific plans for compliance with laws and policies, and inventories air quality. More mitigation may be added to project proposals to further reduce potential impacts. These procedures assure that the agencies' practices conform to federal, state, and local air quality regulations. For example, prescribed burning must comply with BLM Manual Sections 9211.31(E)--Fire Planning—and 9214.33--Prescribed Fire Management—to reduce air quality impacts from smoke. Prescribed burns must also comply with state and local smoke management programs, which specify the conditions under which an area may be burned.

Although the precise air quality impacts from rangeland management alternatives cannot be measured, any practice that increases vegetation cover and growth helps reduce wind-blown dust (particulate matter). But high particulate levels should be expected in arid areas with periodically dry lakebeds or soils high in silt.



## Climate

Throughout most of the study region, precipitation is the main limiting factor for the timing and amount of vegetation growth. Although temperatures also influence growth, warming temperatures typically dictate when growth begins, not whether it would occur.

By comparing the short-term climatic situation to long-term climatic conditions, rangeland managers can adjust the timing and amount of allowable grazing before issuing permits. For example, dry soil conditions resulting from multiple years of below normal precipitation would require significant subsurface recharge before significant vegetation growth is likely to occur. Similarly, if the soil profile is hydrated during the dormant season, significant plant growth may still occur in the face of a relatively dry spring. Other weather and climate relationships determine the occurrence and timing of seed development and root growth.

## Special Status Species

Both BLM and the Forest Service are committed to managing for the recovery of threatened or endangered species. Under all alternatives, species recovery plans would continue to be implemented. Therefore, the alternatives would differ little in their impacts to federally listed species, except where one or more might indirectly expedite recovery and improve habitat to minimize future listings.

Later actions under the alternatives that might affect threatened, endangered, or proposed species would be subject to formal consultation or conference with the U.S. Fish and Wildlife Service or the National Marine Fisheries Service under Section 7 of the Endangered Species Act. BLM and the Forest Service would consult on such actions evolving from local standards and guidelines tiered to this environmental impact statement as discussed in Chapter 2. Similarly, conferences would be conducted for species proposed for federal listing.

Federal candidate and state threatened and endangered species may not be federally listed as threatened or endangered. BLM and the Forest Service, therefore, give priority to special cooperative habitat management to ensure the

restoration of such species. The Forest Service also designates sensitive species to ensure that their populations do not decline to the point that they need to be listed as threatened or endangered. The BLM uses the term sensitive species for state-listed, federal candidate, and other nonfederal listed species that require special attention. Both BLM and Forest Service policies are to manage sensitive species so that they do not need to be federally listed as threatened or endangered. In this Draft EIS, "sensitive species" refers to special status species that are not federally listed.

Under all alternatives, species recovery plans would continue to be implemented, though at differing rates with respect to grazing management needed to meet recovery objectives.

Habitats for threatened and endangered (T&E) anadromous fish would be managed for protection and recovery regardless of Rangeland Reform or whether PACFISH, which is under development, is pursued. Such habitats are subject to the Endangered Species Act, including implementing recovery plans and Section 7 consultation with the National Marine Fisheries Service on all existing and proposed actions. Anadromous T&E habitats now represent about 20 percent (3,500 miles) of all anadromous habitats on federal rangelands in the Pacific Northwest. This proportion would likely increase as new stocks, now at risk of extinction, are designated as threatened or endangered.

Many sensitive species occur locally, or their status designation is local or statewide. Sensitive species likely to be affected locally would require careful consideration in the site-specific environmental analyses for management changes as discussed in Chapter 2. Sensitive species would be treated according to their status during site-specific ecological evaluations or environmental analyses for management changes that implement actions described in the alternatives. Attempts toward ecosystem-based management, including incorporation of standards and guidelines under some alternatives, would promote BLM and Forest Service goals of ensuring that sensitive species are restored and would not need to be federally listed as threatened or endangered.

Habitats for threatened and endangered species would be managed for protection and recovery by implementing recovery plans and



through Section 7 consultation with the Fish and Wildlife Service or the National Marine Fisheries Service. Standards and guidelines developed under consultation and recovery plans would override those within the range of alternatives described in this document. Therefore, alternatives would be similar for habitats of federally listed species, except where parts of policy or regulations in some alternatives could indirectly expedite recovery. Most change would be attributed to the other special status species termed "sensitive" in this document.

## Cultural and Paleontological Resources

Although continued grazing practices and rangeland improvement projects could affect cultural and paleontological resources, many early remnants of the livestock industry are now part of the historic landscape. As the livestock industry has developed in the past 100 years, prehistoric and historic properties have been destroyed, and traditional lifeway values of both indigenous and nonindigenous groups have been affected (Horne and McFarland 1993; DOD, ACE 1990; Osborns and others 1987).

In riparian zones, around springs and watering tanks, along livestock trails, and in confined areas such as holding pens, livestock trampling can easily destroy shallow archaeological and paleontological deposits as well as the vegetation in Native American traditional plant gathering locales. The impact on riparian zones is particularly significant since cultural resource site densities tend to be higher in these areas. Not only do livestock accelerate bank erosion along streams where cultural deposits are often buried, but the depletion of ground cover through trampling and overgrazing hastens the erosion of cultural properties by wind and rainfall. Further, cattle rubbing against objects can destroy historic structures and rock art.

Hundreds of National Historic Preservation Act (NHPA) Section 106 compliance documents in field offices throughout the West have reported that any cultural resource on or near a rangeland activity is vulnerable to vandalism; theft; impacts from vehicles and livestock; loss of integrity through the altering of the surrounding environment; and introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting.

In addition, increased access from rangeland undertakings may further help destroy cultural resources. Increased visits to areas can cause the attrition of historic values on an area as well as a site-specific level.

Cultural resources may be damaged by earthmoving equipment such as bulldozers, backhoes, drills, and hand tools, or when roads, trails, and other access routes are developed, maintained, or improved to facilitate rangeland operations. The severity of effects varies with the intensity of the proposed activities.

To the extent that the proposed changes would inhibit rangeland development, fewer cultural resources would be discovered and inventoried as a result of the Section 106 (National Historic Preservation Act) compliance process. On the other hand, if development is inhibited, fewer cultural resources would be destroyed by these activities. In addition, to the extent that rangeland improvements are removed and new improvements are developed for other resources, cultural resources would be harmed.

Historically, ranching has directly conflicted with Native American traditional lifeway values. Many Native Americans also rely on ranching for their livelihood. In addition to effects from surface disturbance similar to cultural resources, Native American traditional values can be affected by activities that interfere with resource gathering and religious practice. The following are some examples:

- Some religious practices, such as vision quests, require solitude and isolation.
- Practices such as human burial require protection from disturbance and access by family and tribal members.
- Access to traditional use plants may be limited during the relatively short periods when they may be obtained.
- Traditionally used resources may be destroyed by ranching.
- Sacred sites such as medicine wheels or caves may be damaged or desecrated by livestock.

The effect of the proposed changes would vary with the extent to which plants, minerals, and other resources and locations are either de-



stroyed or made inaccessible. These effects can be minimized through ongoing consultation with affected Native American groups and persons, as outlined in BLM Manual 8161, concerning both regional and project-specific effects.

Changes in grazing management might also affect traditional cultural properties by redefining the landscape of western towns, rural areas, buildings and structures, and other resources developed to sustain and express a specific way of life. The potential loss of these elements of the landscape, which have been shaped and sustained by this traditional lifestyle, must be accounted for at the local level using the requirements for considering traditional cultural properties in the National Historic Preservation Act (specifically Sections 106 and 110).

Surface disturbances in soft sedimentary rocks and unconsolidated soils might threaten paleontological resources just as such disturbances could affect cultural resources.

Ranching may also have the indirect effects involving unauthorized removing of paleontologic resources, destroying paleontologic resources by all types of off-highway vehicles, and other activities. Such destruction is accelerated by population increases as well as by developing or improving roads or trails for ranching. Changes to the earth's surface can also indirectly harm paleontologic resources through erosion and weathering.

## Economic Conditions

### Permit Value

The Federal Government does not recognize private ownership of grazing permits, and the federal courts have affirmed the government's position that raising the grazing fee is not a "taking" of property protected by the Fifth Amendment to the United States Constitution. In light of these rulings, the following discussion describes how the value of federal grazing permits may be affected by changes in federal grazing fees and forage allowed for livestock grazing, despite permittees' lack of legal claim to such value.

In theory, permit value results in part from the Federal Government's charging less than market value for forage on federal land. Under this theory, the private market recognizes that an increase in grazing fees reduces permit value.

As mentioned in Chapter 3, permit values in reality are likely affected by a variety of market forces.

According to the theory, retaining the current PRIA fee formula would generally maintain permit values, all else being equal. At the same time, however, uncertainty over the future fee may cause permit values to be discounted.

As a general rule, a ranching operation which possesses a grazing permit is worth more than a similarly-situated ranching operation that does not possess a grazing permit. The real estate market recognizes the difference in value between the two types of ranching operations in purchases and sales of such property. The difference in value reflects the benefits associated with the federal grazing permit. Since the increased value of a ranch with a grazing permit is tied directly to the permit, a long line of court cases has held that ranch owners with grazing permits can not recover from the United States for losses in ranch value due to modifications of their grazing permit. Recognition of permit value by the federal land management agencies would allow permittees to retain the capitalized value of a public resource, a resource that has never been conveyed by the public to the permittees. This would place the government in the awkward position of being required to compensate ranch owners for a privilege that was conferred by the government in the first place. A privilege is not a compensable right.

Reduced permit value may also affect the debt to equity position of certain affected permittees, at least in the short term. The significance of the impact depends upon when the permit was acquired and how much value the permit loses. For permittees who have just acquired permits where the permit values were not discounted, the impact might be significant. For permittees who have held their permits for years, the impact might not be significant because they have benefitted from lower fees through the years and thus have already captured much of the permit value associated with lower grazing fees.

When federal forage is reduced or eliminated, the value of the permit could also decline. Whereas increasing grazing fees reduces permit value, total loss of public grazing essentially eliminates the value of the permit. A permittee that loses all or part of a permit loses the capital value that the permit contributed to the associated ranch for sale or lending purposes.



If the loss of federal grazing results in an inability to use some of the associated base property in the ranch, then the impact on ranch value could be greater than just the loss of the capital value of the permit.

The value lost from reductions in federal forage would vary considerably depending on such factors as how critical federal grazing is to the economic viability of the ranch, alternative sources of forage, season of use, whether all or a small percentage of the grazing is eliminated, and location of the federal grazing lands.

If the loss of federal grazing results in a ranch's losing economic viability, then the loss could be significant. For example, if a ranch uses private hay land and relies entirely on federal lands for grazing, loss of the grazing could make the ranch inviable. The private hay land would still have value, but probably not as much value as it would have if it were part of a viable economic unit. On the other hand, a ranch property such as this could be leased or sold to another ranch operation, thereby maintaining its productive capacity.

### **Payments-in-Lieu-of-Taxes (PILT)**

Appendix H, Payments-in-Lieu-of-Taxes (PILT), describes in detail the relationship of PILT to grazing fee receipts.

Counties that receive PILT payments under PILT Formula A may experience a decrease in their PILT payments with an increase of grazing fees returned to them. But the total receipts paid to these counties (the sum of grazing fee receipts and PILT payments) would remain unchanged because for each dollar increase (or decrease) in grazing fee receipts, PILT payments would decrease (or increase) by the same amount.

In many western states, federal grazing fee receipts returned to the state are passed through directly to counties for school districts or other special or single purpose districts. In this circumstance, grazing fee receipts are not deducted from PILT payments under Formula A. For these counties, PILT payments would be unaffected, and the only impact would be the amount by which grazing fee receipts increased (or decreased).

Counties that receive PILT payments under PILT Formula B would experience no change in PILT payments regardless of changes in grazing fee receipts.

### **Red-Meat Prices**

Red-meat prices would not be affected under the proposed alternatives. Red-meat prices are discussed in more detail under the No Grazing alternative.

### **Fee Phase-In and Incentives**

The BLM and Forest Service propose to include the provisions for a 3-year phase-in of the fee and a 30 percent fee incentive for qualifying lessees. The qualification criteria will be developed in a future rulemaking. Under the proposal, if no incentive qualification criteria are developed and approved, only the second year phase of the fee increase would occur. Impacts presented here are based on the assumption that any fee would be implemented fully with no incentive. If however, an incentive is in place, the cumulative impacts of the fee increases with incentives on permittees would be reduced by the amount of the incentive itself times the number of permittees who qualify. If no incentive is in place then the impacts would be less than presented under the proposed action. See the impacts for the Modified PRIA formula (\$3.69 fee) for an approximation of the impacts if no incentive is developed and only the second year of the phase-in is implemented.

### **Recreation-Related Economic Impacts**

Recreation and tourism are two areas of economic activity likely to be affected by Rangeland Reform '94. Impacts on employment and income from recreation and tourism would be seen in the trade and service industries (where recreation occurs), within manufacturing industries (where recreational products and supplies are purchased), and in transportation industries (to recreational areas).

The analysis in this EIS does not estimate potential changes in recreation visitor use days resulting from rangeland management alternatives. But to give a perspective on potential economic implications of changes in recreation use, the following table gives changes in employment and income from a change of 1 million recreational visitor days for big game hunting, fishing, and nonconsumptive wildlife use (viewing, photography).



**Employment and Income Effects  
of a Change of 1 Million  
Recreational Visitor Days**

	Employment	Income (1993 \$)
Big Game Hunting	930	\$34,344,000
Fishing	730	\$27,955,000
Nonconsumptive Wildlife Use	700	\$25,179,000

Source: Forest Service 1993f (IMPLAN)

### Noncommodity Environmental Values

The economic impacts addressed in this EIS are primarily associated with commodity production resulting from changes in resource conditions. The environmental analysis also identified impacts for a wide variety of environmental resources that are not associated with commodity production and, thus, do not possess easily identifiable economic values. Nonetheless, these resources may have significant nonmarket values and should be considered when establishing public policy for rangeland management.

Resources and ecosystem processes with nonmarket values include watersheds, air and water quality, visual amenities, fish and wildlife habitat, vegetation conditions, ecosystem health, biodiversity, and resource sustainability. Improvements in these resource conditions may provide significant nonmarket societal benefits that may improve social welfare. These benefits would offset the economic costs associated with reduced income and employment from loss of commodity production (e.g. livestock production). Because these benefits do not have identifiable economic values, however, the extent to which they would offset losses in employment and income is unknown.

### Social Conditions

The social effects of implementing any of the alternatives under consideration would be manifested in a variety of ways. These effects would differ from individual to individual and community to community. Therefore, the effects described in this analysis are generalized

to describe what are believed to be the most likely consequences for the affected individuals and communities.

Effects to people and to the functioning of their communities are complex and closely interrelated. Some effects, such as income and employment changes, are quantifiable. Effects to lifestyles, personal values, and attitudes are harder to quantify and explain. Economic and social effects need to be integrated to determine the social consequences of the alternatives.

The cumulative effects of each alternative are integrated into each analysis section or carried forward into another section. For example, the cumulative effects of impacts to individual permittees will be discussed under *Counties and Communities*.

Another aspect of social cumulative effects is the integration of fee changes with changes in regulations and revised management standards and guidelines. A third aspect of cumulative analysis is the integration of changes that are already ongoing in the affected environment. This complicated social reality is recognized throughout the analysis.

The main analysis headings are Permittees, Counties and Communities, and National Impacts. Introductions to the Permittees and Counties and Communities discussions are presented below. These introductions examine in more detail the types of impacts that are discussed under each alternative.

### Permittees

This section presents an overview of the types of impacts a reduction in ranching activities could have on ranchers. Discussions under the different alternatives depend in part on references to this section. This section should be kept in mind when exploring the alternatives.

About 27,000 ranchers hold federal permits in the 17 western states. Permittees, ranch family members, ranch employees, and other people and businesses associated with the livestock industry would be most affected under each alternative because changing fees and regulations would directly affect ranch operations. But, due to the variety of economic and social situations facing permittees, not all permittees, ranch employees, or associated businesses would be affected in the same way. County and regional differences in scenic quality, recreation and tour-



ism, and economic diversity mean that some permittees could adapt and prosper under the changing circumstances and some could not.

Many permittees feel that their lifestyle and economic stability are threatened by the Rangeland Reform '94 proposals. Signs of social stress are evident in the ranching community's comments on this analysis. These comments detail concern about permittees' future ability to continue local ranching customs and culture, and the "western way of life." They feel that Range Reform, in combination with other recent changes in natural resource management, such as timber management and endangered species regulations, is designed to remove ranchers from public lands and that these proposals will negatively affect the relationship between federal land management agencies and westerners.

Some permittees also believe that an increase in grazing fees will cause economic hardship and jeopardize the economic vitality of their ranches due to their already slim profit margins. They believe that loans may be harder to obtain, and permittees may be forced to lay off employees, abandon leases, or subdivide and sell land to developers. They feel the result would be harm to the regional economies from ranch bankruptcy or sale, and decreases in the value of recreation and tourism drawn by the local ranch culture and open spaces.

Under some of the alternatives proposed in this EIS, some permittees may decide to scale back or sell their ranches. These permittees or their family members may have to seek new employment. Finding satisfactory new employment is difficult for some groups. The stress associated with the need to change professions and possibly lifestyles has repeatedly surfaced as an important social problem. All people, through the socialization process, acquire a mental picture of who they are. Groups such as loggers, ranchers, fishermen, and farmers tend to strongly identify themselves as belonging and being in a certain life role. They have an extremely hard time imagining themselves being anything else (Lee and others 1991). This phenomenon is especially true if the person has been engaged in a business and lifestyle since childhood and has 20, 30, or more years of living in that social context, as have many western ranchers.

## Counties and Communities

This section gives an overview of the types of impacts the counties and communities (described in Chapter 3) might experience due to a decline in local ranching activity. The discussions under the different alternatives depend in part on references to this section. Under the discussions of different alternatives, county examples will be given where suitable. This section should be kept in mind when exploring the alternatives.

The effects to communities would vary a great deal depending on the community capacity to adapt to internal and external forces and the consequences of the management decisions. Community capacity depends upon the community members' ability to pursue collective goals; the skills, experience, and educational levels of people in the community; the size and diversity of local businesses; and the community's access to financial capital, transportation, markets, and raw materials (Forest Ecosystem Management Assessment Team 1993).

Generally, small isolated communities are more vulnerable to external forces due to their less active leadership, weaker links to centers of political and economic influence, lower levels of economic diversity, and lack of control over resources and capital. These small communities are more likely to experience unemployment, increased poverty, and social disruption in the face of shifts in management policy (Forest Service and BLM 1993a).

Reductions in business and permittee economic activity could also lead to reduced revenue for local infrastructure and services, such as schools, medical care, and law enforcement. The population of many of these communities is aging more rapidly than the population in general and may have high demands for services such as transportation and medical care. In addition, the school is often the focal point of the community. As Jobs (1986) points out, "The local school draws residents together for shared activities and symbolic events." If financial problems in the community eliminate the ability to support a school or reduce the effectiveness and frequency of school activities, the school's ability to foster community cohesiveness would decline.

Since many of these trends are already occurring, some communities will change even if



livestock grazing management does not change. In some areas changing livestock grazing management may accelerate the ongoing transition from an agriculturally based economy. Under alternatives where recreation quality increases, however, Rangeland Reform '94 might help some communities take better advantage of the recreation and tourism opportunities in their area and may enable some permittees to find part-time work that would allow them to stay on their land.

## ***Assumptions and Analysis Guidelines Common to All Alternatives***

### **Vegetation**

#### **Upland**

Areas that have been taken over by invading annuals, such as cheatgrass, would not improve significantly under any alternative without vegetation manipulation. The same situation would be true for areas of high-density juniper or sagebrush with little perennial herbaceous understory.

Ecological status and vegetation trend in the uplands would not be significantly affected by any alternative in the short term because uplands would need more than 5 years to significantly change.

The functioning uplands (BLM-administered lands) and meeting or moving toward management objectives (Forest Service-administered land) would most notably improve in the short term (5 years) only under the Environmental Enhancement and No Grazing alternatives. The methodology for determining condition of uplands is discussed in Appendix I, Biological Methodology.

Changes or improvements of uplands under all alternatives would be most apparent in areas with 12 inches or more annual precipitation.

#### **Riparian/Wetland/Aquatic**

For each alternative this impact analysis used a range of improvement or degradation percent-

ages for the expected rates of change in riparian resource condition. A range was used because the analysis regions vary in the amount of riparian resources being grazed, the extent of human and agricultural development, the relative overall riparian and upland condition, soil stability and productivity, and annual precipitation. The methodology for determining condition of riparian condition is discussed in Appendix I, Biological Methodology.

### **Wildlife**

The environmental impact analysis focuses on policy and regulation changes that would affect wildlife populations associated with the vegetation communities. Given the close association of riparian resources and aquatic habitats, this analysis assumes that improved riparian area condition would substantially benefit aquatic resources.

How riparian vegetation influences upland wildlife partly depends on to what extent species depend on riparian areas and the juxtaposition of the riparian and upland habitats. Increased structural diversity of vegetation generally increases the number of habitat components within any ecosystem that benefit wildlife and biodiversity.

Increases in residual plant material, plant mass, plant litter, residual seed material, and opportunity for root growth and new plant establishment in riparian areas benefit the functioning of riparian areas and riparian wildlife (Anderson 1993).

The current trend for upland areas is slightly upward, and for riparian areas is slightly downward. The downward riparian trend results from the difficulty of preventing livestock from congregating in riparian areas and the current amount of year-long and continuous season-long grazing in riparian habitats.

Continuing harmful habitat changes such as exotic species invasions, particularly on lower and mid-elevation rangelands, would offset positive changes within some regions. The onslaught of cheatgrass, medusahead wildrye, knapweed, and leafy spurge would continue to lessen the amount and degrade the quality of upland wildlife habitat. Any improvement in plant vigor and composition within a plant community might be partially to significantly offset by habitat losses resulting from such inva-



sions. The megatrend of some invasions for decades would continue to threaten the maintenance of habitat integrity and biological diversity.

Other wildlife assumptions are as follows:

- The number of plants and animals recognized as special status species would increase.
- Big game populations would continue to increase.
- Public demand for nonconsumptive use of wildlife, including viewing, would continue to rise and would become a major factor in future management.
- The desired plant community concept would be implemented, and the desired plant community would not necessarily be the potential natural community.

## Wild Horses and Burros

The following assumptions were applied to the analysis of the impacts to wild horses and burros:

- Standards and guidelines for managing domestic livestock grazing do not apply directly to managing wild horses and burros.
- Appropriate management levels (AMLs) would be established or changed mainly as a result of site-specific monitoring as a site-specific issue. For the analysis in this EIS, AMLs would remain constant throughout all alternatives.
- The issue of wild horse and burro overgrazing is not within the scope of this EIS.
- Wild horses and burro populations would be at appropriate management levels within the short term under all alternatives.

## Recreation

The following assumptions were applied to the analysis of impacts to recreation:

- Current livestock grazing generally degrades the quality of recreation user experiences.
- The diversity of recreation users and uses is increasing.
- Recreation users have increasing needs for access to federal lands.
- Intensified grazing management needed to control livestock and protect other resources requires an increasing accumulation of structures.
- Recreation users are becoming increasingly sensitized to intrusions, including livestock and structural range improvements.
- Sensitive recreation areas include developed recreation sites, national recreation areas, national conservation areas, components of the national wild and scenic rivers system, areas of critical environmental concern important to recreation users, and units of the National Park System that have livestock grazing administered by BLM.

## Economics

The analysis of economic impacts for all management alternatives across the range of grazing fee formulas is based on the following assumptions and methodologies:

1. The analysis is based on the 3-year average number of BLM AUMs **authorized** (paid for) in fiscal years 1990, 1991, and 1992, and Forest Service head months **actual use** in calendar years 1989, 1990, and 1991. (See Appendix J, Three-Year Average AUMs Authorized [BLM] and Actual Use [Forest Service].) Forest Service head months are equivalent to BLM AUMs.
2. Under the BLM-Forest Service Proposed Action, the Forage Value Index was



changed recently from 1.08 as described in the ANPR to 1.00. This change was described in Chapter 1 and Chapter 2. (The Forage Value Index is one of the variables in the fee formula chosen as the Proposed Action). Changing the index caused the resulting fee to decline 7.5 percent from \$4.28 to \$3.96. With this change, the new proposed fee falls almost exactly at the midpoint between \$4.28 (fee alternative 3) and \$3.72 (fee alternative 6), which are both analyzed in this draft EIS. The impacts for the Proposed Action are presented as a range between those caused by a \$4.28 fee and those caused by a \$3.72 fee.

3. Under each fee formula, the calculated fee for 1993 was used to estimate impacts, with the analysis assuming that the entire phase-in period has occurred. Thus, the impacts presented here should be viewed as those occurring **after** complete phase-in. Fees under each formula would vary from year to year. Appendix K, Total Increase in Grazing Fees Paid by Permit Size by Fee Alternative, shows for each 1993 fee level the total dollar increase in grazing fees that permittees would pay. The increases are shown for permits in the following AUM groups: permits with 1-500 AUMs, 501-1000, 1001-2000, and 2001+. Appendix L, A Comparison of Grazing Fee Formulas from 1983 to 2003, shows historic and projected fees under each different fee formula.
  4. The demand for forage on public lands, national forest lands, and national grasslands is assumed to remain constant across all fee levels, at the 3-year average levels. The analysis further assumes that, as long as the fee is equal to or less than the values for federal forage determined by forage value appraisals conducted in the mid-1980s (see Appendix B), public land forage would continue to be in demand in the long run. But some current operations may not continue to operate at higher fee levels, and the amount of forage demanded would decrease at higher fee levels for some operations. The analysis thus assumes
- that the forage associated with these operations would be acquired by other operations.
- A wide range of viewpoints exist regarding the economic implications of higher grazing fees. Appendix M, Summary of Findings of Non-Government Grazing Fee Studies, presents a summary analysis of a variety of studies that have been conducted on this subject. These studies support a broad range of conclusions on the economic effects of different grazing fee levels and point to the continuing debate surrounding this issue.
5. For analysis purposes, fees under competitive bidding (fee alternative 7) are assumed to be the same as those under the regional-fee alternative (fee alternative 4). Fees set by competitive bid in any given region would likely fall across a broad range of values. Thus, the regional fees under fee alternative 4 should be viewed as an average competitive bid fee for representing a wider range of potential fees.
  6. Grazing fee receipts will be distributed as currently authorized by law.
  7. Micro-IMPLAN was used to estimate changes in employment and total income. Micro-IMPLAN is a Forest Service economic impact modelling system used extensively to estimate the economic effects of programs, policies, and actions. Micro-IMPLAN uses a consistent set of regional accounts and software for building predictive input-output models, and a demand-driven analysis system for analyzing policy questions such as changes in grazing fees and forage levels. See Appendix N for more detail on the Micro-IMPLAN methodology used for this analysis.
  8. The methodology used to estimate reductions in net cash returns for ranch operations was developed using an analysis developed by the USDA, Economic Research Service (ERS). This analysis appears in Appendix G, Economic Aspects of Supply and Demand



for Livestock Forage on Public Lands. The methodology developed by BLM to estimate impacts to ranch income using the ERS analysis appears in Appendix O, Changes in Ranch Returns from Reduced AUMs and Higher Grazing Fees.

## ***Assumptions and Analysis Guidelines by Alternative***

### **Current Management**

- Funding would remain constant.
- Management priorities for the rangeland program would remain the same.
- Long-term ranch and rural economic trends would continue and not change.

### **Proposed Action**

- Funding would increase because of the increased grazing fee.
- Nonfunctioning areas would not be grazed.

### **Livestock Production**

- Funding would increase because of the increased grazing fee.
- This alternative is directed toward local control.
- The main purpose of this alternative is to maintain local custom, culture, and lifestyle, not necessarily reduce or increase livestock grazing.
- Grazing advisory board recommendations must conform to applicable law, regulations, and land use plans.

### **Environmental Enhancement**

- Funds would be constant.
- Grazing would continue in areas that are functioning properly if not in conflict with other land use plan objectives.

- No grazing would be allowed in nonfunctioning areas and areas that are functioning but susceptible to degradation until such areas reach properly functioning condition.
- No grazing would be allowed where the functioning condition has not been determined.
- No grazing would be allowed in designated wilderness (BLM recommended suitable and forest plan recommend wilderness, developed recreation sites, and where grazing would conflict with areas of designated critical habitat (desert tortoise, Pacific salmon) and areas of national and historic cultural significance.
- More forage would not be allocated to livestock but instead could be used to satisfy state wildlife agency population objectives for big game.
- Grazing administration costs and workloads would increase.
- Funding for fencing eligible cultural sites and other sensitive areas excluded from grazing would continue at current levels.

### **No Grazing**

- A rangeland funding need of 30 percent of 1990 funding levels would be needed to administer No Grazing.
- Trailing permits would continue to be issued.
- There would be a 3-year phase-in for full implementation.
- Livestock control to prevent unauthorized use of BLM- and Forest Service-administered land would be the responsibility of the adjacent landowners.
- Range improvement projects would be removed if they are detrimental to other resources or if they conflict with other uses.



- The administering federal agency would be responsible for removing fencing, spring developments, and storage tanks not needed for livestock.
- Operators who lose their grazing privileges will be permitted to salvage their range improvement investment according to cooperative agreements.
- Where determined to be needed to benefit wildlife or other resources, vegetation manipulation methods will be used to stop succession. These methods may include prescribed fire, mechanical manipulation, and livestock grazing.

## Alternative 1: Current Management (No Action)

### Grazing Administration

#### Livestock Use Levels

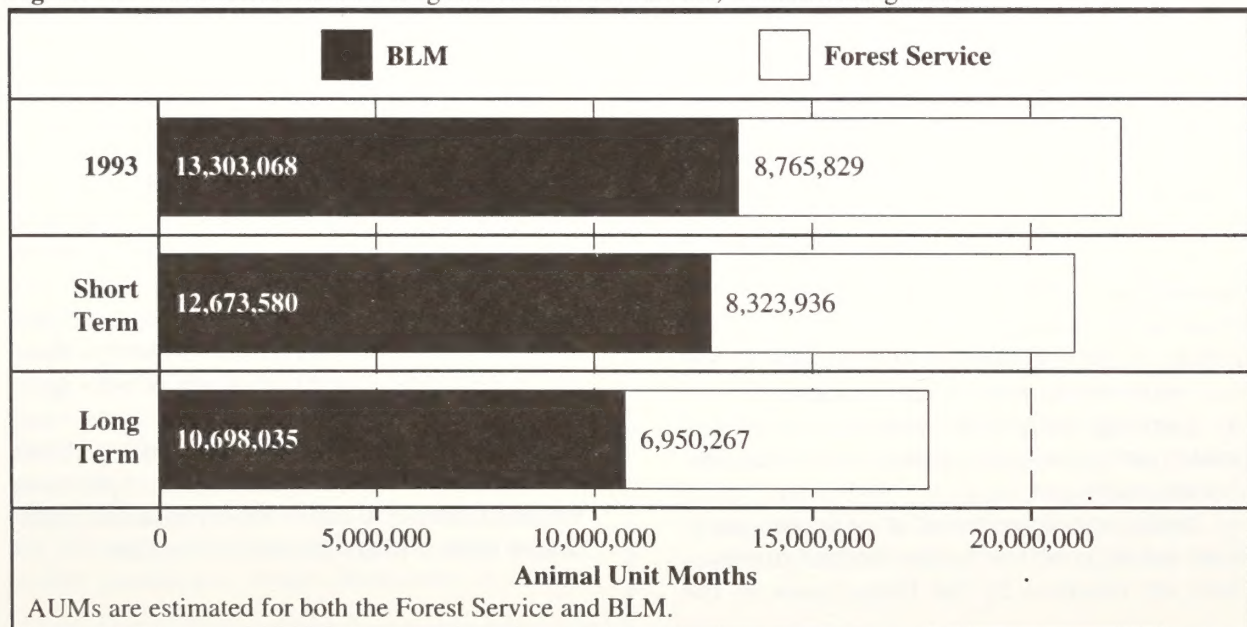
National statistical reports show that forage consumed by livestock on federal rangelands has declined by 6 percent (BLM) and 8 percent (Forest Service) per decade (BLM 1992a; Forest Service 1993a). These changes can be attributed to many factors, including agency decisions based on carrying capacity and resource protection,

and operator decisions based on personal or business considerations. These trends are expected to continue during the foreseeable future with or without programmatic changes in federal rangeland management policies and practices.

For example, transitions from rural to urban communities are expected to reduce the future number of livestock operations. Implementing environmental laws such as the Endangered Species Act would continue to greatly affect how livestock are managed on federal lands, as in managing to protect the endangered Snake River sockeye salmon in the Northwest and the desert tortoise in the Desert Southwest. The net result is that Current Management is expected to result in a 5 percent decline in animal unit months (AUMs) of forage authorized for livestock grazing by both agencies within 5 years and an 18 percent decline in AUMs authorized by BLM and a 19 percent decline in AUMs authorized by the Forest Service in 20 years. (See Figure 4-1 for estimates of short- and long-term livestock reductions on BLM- and Forest Service-administered lands.)

There would, however, be regional departures from this national trend projection. Most notably, in the long term the amount of forage allowed to be grazed by livestock on Forest Service-administered lands in the Columbia Basin analysis area is expected to decline by only 10 percent. This small amount would result from

Figure 4-1: Available Livestock Forage in Animal Unit Months, Current Management





a large part of the area's Forest Service-administered land already meeting management objectives and the prediction that all but 2 percent would meet forest plan objectives in 20 years.

## Program Efficiency and Effectiveness

Under Current Management, BLM and Forest Service regulations would continue to be inconsistent in many areas: leasing, prohibited acts, grazing advisory boards, suspended nonuse, unauthorized use, decisions and appeals process, grant policy, Range Betterment Fund use, water rights (national policy), foreign corporations, and service charges. Such inconsistencies would continue to impede these agencies in implementing ecosystem management. These inconsistencies would continue to confuse permittees and the public.

Under Current Management, BLM would retain its current method of issuing penalties for unauthorized use, which is highly effective because the accelerating level of penalties discourages repeat violations. The relatively low fines charged by the Forest Service have caused problems with repeat trespassers, and these problems would continue.

Under current grazing regulations, BLM would continue to handle incidental use following the same process and levying the same penalties as for more serious cases. In practice, BLM drops many of the cases of incidental use to avoid spending scarce staff time on insignificant cases. The General Accounting Office reported that "BLM range staff do not consider it an efficient use of resources to incur the expenses associated with detecting, investigating, and resolving most minor, non-willful violations" (GAO 1990). As a result, BLM's strategy of resolving incidental trespass would continue to be inconsistent with its federal grazing regulations.

BLM and the Forest Service would continue to authorize significant amounts of active AUMS annually for nonuse. Annual applications for nonuse would continue to result in administrative inefficiencies and a large workload.

Tracking and maintaining records of suspended nonuse would continue to create administrative inefficiency.

Implementing appealed BLM grazing decisions would continue to be delayed until appeals are resolved by the Department of the

Interior's Office of Hearings and Appeals or the Interior Board of Land Appeals. Persons or groups could appeal a decision merely to delay its implementation, knowing that the decision would be stayed until the appeal is resolved. Appeals would continue to create a large amount of administrative work. This added workload would continue to delay BLM's completing other work in support of implementing land use plans.

Issuing permits for up to 10 years would continue to generate administrative efficiencies, both in employee time and money spent. Both agencies would continue to have authority to issue permits for shorter periods where needed to meet management objectives.

BLM grazing advisory boards would continue to strongly influence decisions on spending and setting priorities for Range Betterment Funds. Some grazing advisory boards would continue to encourage BLM to spend money on projects serving narrow interests, or to limit the amount of money to be spent on multiple use projects such as wildlife water developments and habitat rehabilitation. But some grazing advisory boards would continue to be a positive force in implementing BLM policy and achieving resource management objectives through review of livestock operators and grazing associations.

BLM would continue to apply for water rights under state law in some states and not in others. Likewise, BLM would continue to protest private water rights filings by grazing permittees for livestock grazing on public land in some states and not in others. Wildlife and other programs would continue to benefit from this policy. We anticipate that, without clarification, conflicts would continue to emerge between private water users, seeking exclusive control of a water source on public lands for livestock grazing purposes, and other multiple uses. BLM staff time would continue to be devoted to resolving such conflicts.

Both agencies are developing policies to promote ecosystem management. As these policies are implemented, the effectiveness of both agencies in achieving and promoting ecosystem health would increase. But until such policies are implemented, grazing management practices would continue to differ for different administrative units within the same ecosystem.



## Availability and Use of Range Betterment Funds

Continuing the current policy of distributing all Range Betterment Funds to areas of origin would continue to prevent BLM from allocating enough money to meet the most critical resource needs, which are not spread equally across resource areas. This policy would retard progress in improving vegetation and other resource conditions, or in resolving other high-priority resource problems. On the other hand, the Forest Service policy of distributing half of Range Betterment Funds to the forest of origin and half to the forest region would continue to allow that agency to channel more money to priorities on a regional basis.

Current limits on Range Betterment Funds would not allow spending funds for resource monitoring and inventories, National Environmental Policy Act analysis, project planning, and initial survey and design. Requiring such costs to be paid with program administration funds reduces the capabilities of those other programs. Restricting Range Betterment Funds to on-the-ground projects would provide a consistent funding level for range improvement projects.

In the long term, a decline in livestock use on federal land and an accompanying decline in grazing receipts would reduce the amount of Range Betterment Funds going to BLM and the Forest Service by about 20 percent (from a 3-year average of \$15.4 million per year to \$12.3 million per year). Coupled with rising costs for range improvements, this decline would allow fewer range improvements to be built in the future. Furthermore, funds would still be needed to rebuild existing projects.

Alternative sources of funding, including increased permittee contributions, agency appropriations, and contributions from other sources, would become more important just for maintaining current management. Without such funding, some existing fences and water development for livestock grazing on public lands would eventually fall into disrepair, and livestock use would become increasingly difficult to manage. Fewer allotment management plans would be implemented each year, and progress would be slowed in meeting a wide range of resource objectives by changing grazing management. Riparian habitat and other resource conditions would deteriorate at an ac-

celerating rate, and livestock grazing might eventually need to be reduced even more than now projected.

## Vegetation

### Upland

In the long term under Current Management, 59,949,000 acres (82 percent) of Forest Service uplands would either be meeting objectives or moving towards objectives (a 2 percent increase from 1993), and another 13,243,000 acres (18 percent) would not be meeting objectives (an 8 percent decrease from 1993). (See Figure 4-2 for estimated changes in uplands.) About 117 million acres (74 percent) of BLM upland acres would be in proper functioning condition (an increase of 30 percent). Another 22 million acres (14 percent) would be functioning but susceptible to degradation (a decrease of 55 percent). Nonfunctioning areas would amount to about 20 million acres (12 percent) of BLM uplands (a decrease of less than 5 percent). (See Figure 4-3 for estimated changes in upland functioning condition.)

Under Current Management, areas having 12 inches or more of precipitation a year would generally change in ecological status from lower to higher seral stages. And in the long term the vegetation in some areas would change from potential natural communities to late seral stages because of overgrazing, fire, or drought and from late seral to mid seral stages. Most improvement would occur on acres in the early seral stages moving into the mid and late seral stages. This change would differ by administrative area since a vegetation community's management would depend on achieving objectives that differ according to an area's resource needs.

### Sagebrush

General condition and trend of sagebrush communities would continue to slowly improve. Within the short term, properly functioning acres would not measurably improve in most sagebrush communities. In the long term properly functioning acres would increase. Bitterbrush and other palatable brush would not change significantly, and seedlings would become established only where the agencies' man-





Figure 4-2: Change in Status - Forest Service Uplands, Current Management

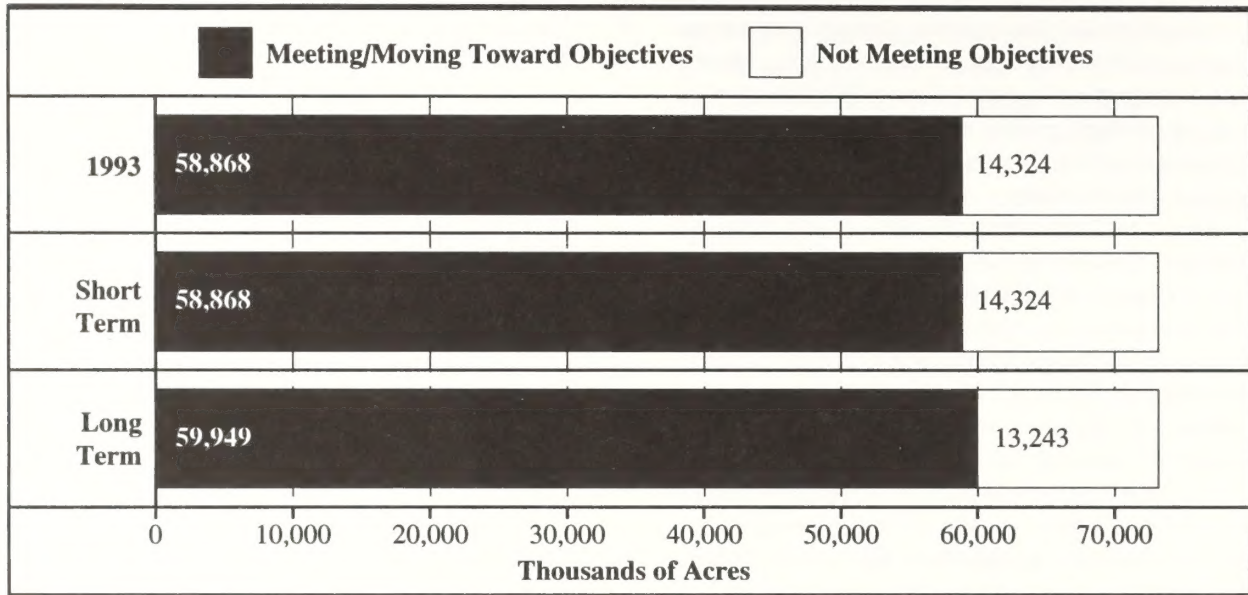
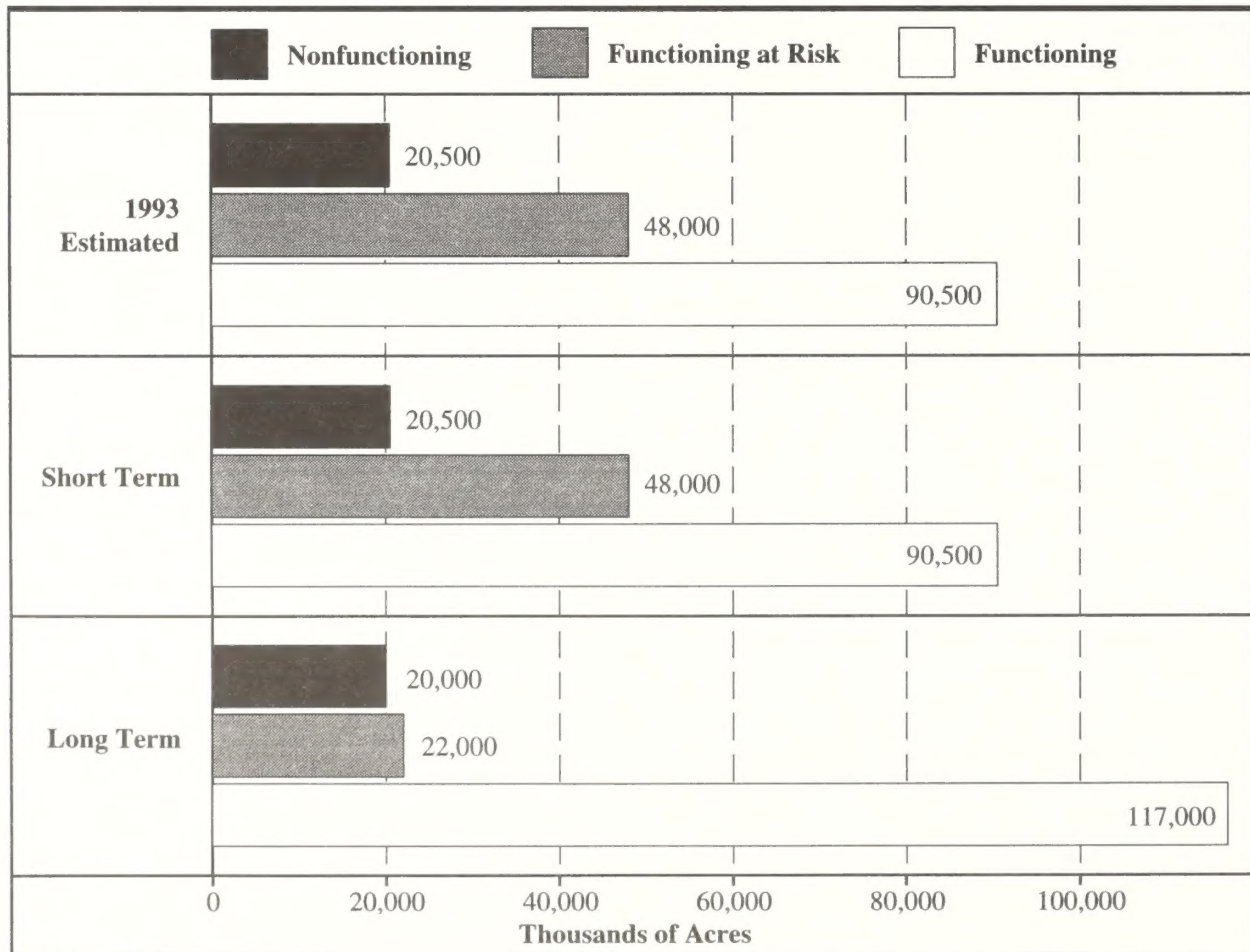


Figure 4-3: Change in Functioning Condition - BLM Uplands, Current Management





agement included seedling protection from livestock grazing.

### ***Desert Shrub***

Desert shrub communities are expected to remain static or undergo a slow-steady improvement. Community dynamics and drought cause these communities to have less variety and production than other plant communities such as the sagebrush. Regardless of the vegetation association, plants occupy about 7 to 8 percent of the surface, with interspace between plants occupied by rocks and cryptobiotic crusts (sometimes called cryptogamic crusts). The forb, grass, shrub, and cryptobiotic components are expected to increase in production and density. Cryptobiotic crusts are important in influencing the nutrient levels of soils and the status and germination of plants in the desert. These crusts are slow to recover after severe disturbance, requiring 40 years or more to recolonize even small areas.

Ecological condition and trend would change slowly due to low precipitation (8 inches or less per year) and high salinity. The time required to implement management plans also helps explain the slow ecological and trend improvement. Revegetation is a long-term process that cannot be induced in these low-precipitation and high-salinity areas.

### ***Southwest Shrubsteppe***

The shrubsteppe ranges of southern New Mexico and southeast Arizona have been improving in condition since the drought of the 1950s, which reduced grass cover by as much as 75 to 90 percent. Improved condition has consisted mainly of increased grass cover, a result of favorable rainfall and sound management. The general trend would be to increase grass cover. The response would vary, depending on site characteristics and weather. Sites with harsh growing conditions would not improve much in 20 to 30 years. Many shrub-dominated sites would continue to be dominated by shrub unless the shrubs were chemically or mechanically controlled (Holechek and others 1989). Although current management appears to have favored the grass component of the community, in some cases the shrub component may increase

over the long term, particular where livestock grazing is excessive

### ***Chaparral-Mountain Shrub***

Under Current Management, scattered stands of shrubs would experience an upward trend, but dense stands would experience no apparent trend without fire or other treatment.

### ***Pinyon-Juniper***

Scattered stands of pinyon juniper would experience an upward trend. However, for dense stands there would be no apparent trend without fire or other treatment.

### ***Mountain and Plateau Grasslands***

Under Current Management, mountain and plateau grasslands would experience slow long-term increases in palatable grass and forb density and vigor, vegetation litter, and the accumulation of fine organic material.

### ***Plains Grasslands***

Current management would be maintained or slightly improve ecological status in the plains grasslands. Succession would gradually trend upward as climate allows. Wheatgrasses and needlegrasses would increase in composition relative to blue grama, Sandberg bluegrass, prairie junegrass, and sedges. Where clubmoss or blue grama prevail, little would be likely to change without the site being disturbed.

Nonriparian drainageways would usually receive heavy grazing under season-long use. While use patterns would continue to be heavier in these areas, rest from grazing and reduced time of grazing would benefit these areas more than the adjacent uplands that have traditionally been less heavily grazed.

### ***Annual Grasslands***

Annual grasslands would experience slow long-term increases in palatable grass, forb density and vigor, vegetation litter, and accumulation of fine organic matter.



### Alpine Grasslands

Alpine ecosystems would not change significantly under Current Management.

### Coniferous and Deciduous Forests

Livestock grazing on seedlings would result in fewer deciduous seedlings surviving to sapling age, the conversion of coniferous/deciduous forests to coniferous forests or other vegetation communities, and accelerated loss of some deciduous stands. The rate of conversion would depend on the combined influence of timber management, grazing, and fire.

### Riparian/Wetland/Aquatic

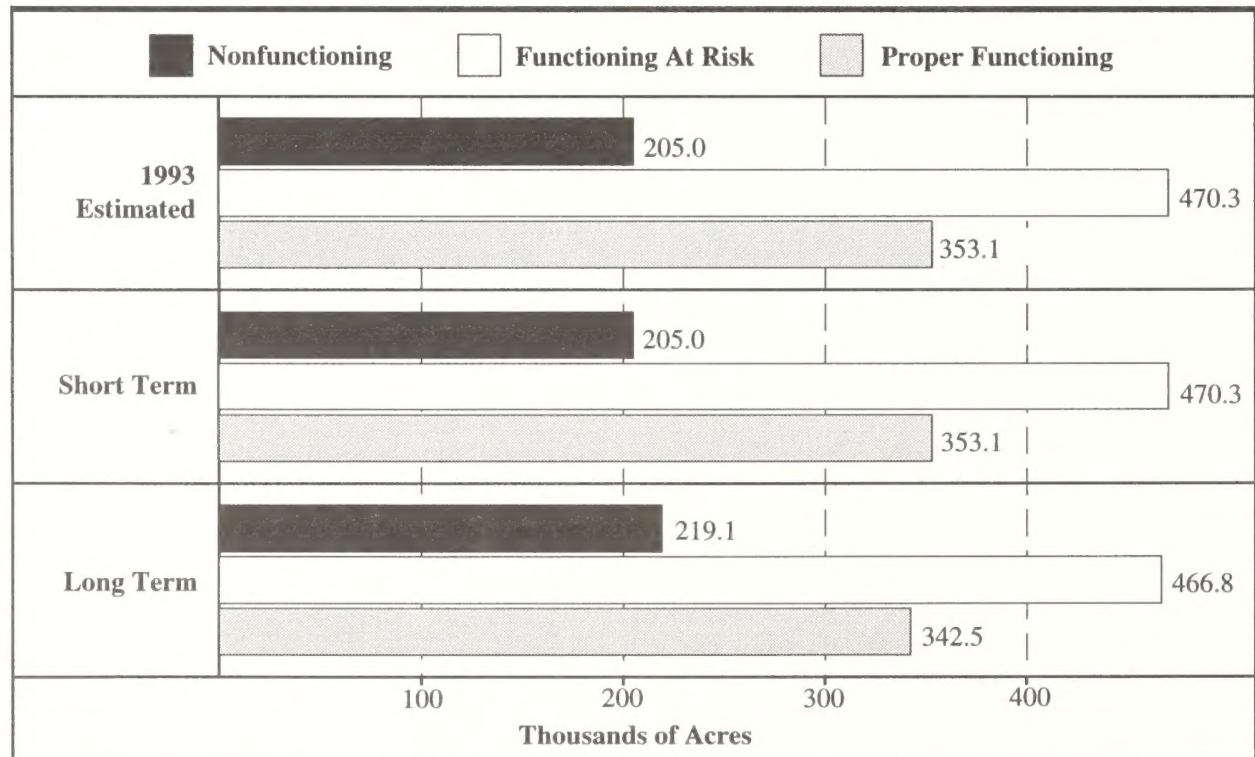
Despite improvements in riparian habitat condition in many small areas, most of the 3.2 million acres of BLM- and Forest Service-managed riparian areas across the West would continue to be affected by livestock grazing under Current Management. Overall trends would continue, resulting in a slow, steady, long-term decline in condition.

In the long term, under Current Management, 342,500 acres (33 percent) of BLM riparian areas would be properly functioning (a decrease of 3 percent from 1993); 466,800 acres (45 percent) would be functioning but susceptible to degradation (a decrease of less than 1 percent from 1993); and 219,100 acres (21 percent) would be nonfunctioning (an increase of 7 percent from 1993). (See Figure 4-4.)

Under Current Management 1,639,474 acres (75 percent) of Forest Service riparian areas would either be meeting objectives or moving towards objectives (a decrease of 4 percent from 1993); another 551,784 acres (25 percent) would not be meeting objectives (an increase of 14 percent from 1993). (See Figure 4-5.)

Continued, season-long grazing on many mountain meadows would reduce vigor in native sedges and grasses, increase bare soil, increase grass species such as squirreltail (*Sitanion hystrix*), and increase forbs and shrubs. The overall acreage of mountain meadows would decline as native sedges (*Carex* spp.) and grasses are replaced by invading shrubs, trees, forbs, and non-native plants. The rate of change would depend upon changes in climate and fire management and on the degree of existing degrada-

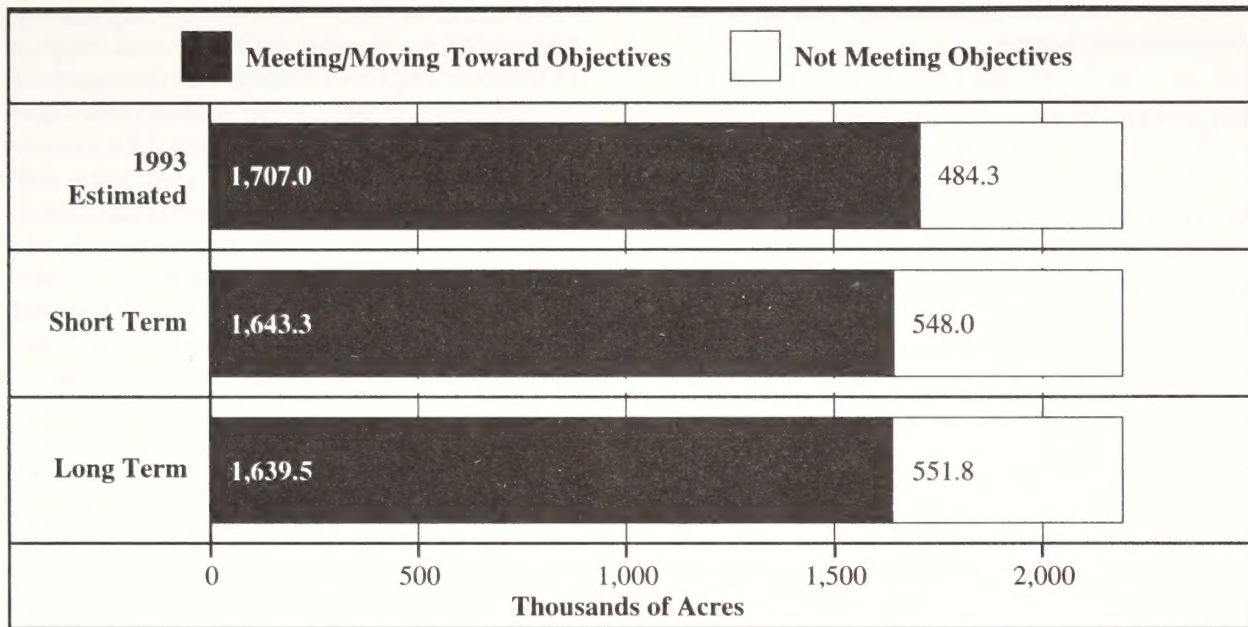
**Figure 4-4:** Changes in Functioning Condition - BLM Riparian, Current Management







**Figure 4-5: Change in Status - Forest Service Riparian, Current Management**



tion, especially stream channel incision. Over the long term, implementing land management plans would slowly increase vegetation litter and palatable grass and forb density and vigor. Fine organic material should accumulate.

Concentrating on projects that directly benefit livestock, the use of Range Betterment Funds would remain the same, perpetuating current riparian habitat condition trends. Some Range Betterment Funds are spent to improve riparian resources, but this practice is infrequent and inconsistent from one area to the next. The overall decline in riparian resource conditions would overshadow local improvements financed by Range Betterment Funds.

With appeals automatically staying BLM's grazing decisions under Current Management, improper livestock grazing would continue to harm many riparian areas until appeals are resolved.

BLM and the Forest Service are developing promising ecosystem management policies but have not yet changed many existing regulations and practices. Under Current Management, neither agency is likely to implement consistent ecosystem management throughout its organization for years. Small, often uncoordinated riparian restoration efforts would continue, but overall, long-term riparian area degradation would also continue. If unchanged, this downward trend in the amount and quality of ripar-

ian resources would contribute significantly to a slow long-term decline in biodiversity.

## Watershed

### Upland

In the short term, climatic variation would more affect upland watershed conditions than would Current Management. Cover, runoff, and accelerated erosion would only slightly change, and the upland drainage network would not improve.

In the long term, the most significant improvements would occur on allotments with progressive new management plans. The trend on upland watershed conditions on allotments without management plans would be static or slightly downward. As activity plans are implemented, upland watershed conditions would slowly and steadily improve. Vegetation and ground cover would increase slightly, and the physical properties of the soil would improve, leading to reduced runoff and erosion.

The current upland drainage network dominated by poorly vegetated gullies would slightly improve as grasses become reestablished in the gullies. Overall improvement would be slight, and the frequency and size of runoff events would change little.



The desert shrub, pinyon-juniper, and sagebrush communities with less than 10 inches of annual precipitation would respond slowly to management actions.

## Riparian/Wetland/Aquatic

The overall hydrologic function of riparian-stream systems, would remain static or decline slightly from existing conditions. Accelerated erosion and runoff from uplands would decrease, slightly reducing erosional stresses and sediment loading to riparian-stream systems.

Even with an overall decrease in forage consumed by livestock and improved upland conditions, livestock would continue to congregate in and overgraze most riparian areas. Sediment discharge caused by streambank trampling in riparian areas would remain static or increase slightly over the long term. Livestock disturbance would continue to result in stream channels cutting or widening, causing the beneficial hydrologic functions of these riparian areas (floodplain function, water quality maintenance, flood peak reduction, and ground water recharge) to remain nonfunctioning or functioning but susceptible to degradation. Figures 4-4 and 4-5 show short- and long-term changes in riparian condition on BLM- and Forest Service-administered lands.

Stream-riparian systems where livestock use has resulted in riparian shrub and tree communities having low vigor and poor reproduction success would continue to produce sediment at or slightly above existing levels. Sediment rates would slightly increase from channel systems progressing through early stages of lateral or vertical (incised) channel instabilities from grazing disturbance. A continued decline of riparian woody vegetation would result in warmer water temperatures and lower dissolved oxygen levels.

Nonpoint-source water pollution generated by livestock grazing would slightly decrease from uplands and remain static or slightly increase from riparian areas. The progressive AUM reduction of 1 percent per year over the short and long term would slightly improve vegetation and ground cover on uplands, reducing accelerated erosion and overland flow. Consequently, sediment yields and other pollutants (fecal bacteria, salinity, and nutrients) carried by overland flow would slightly decline.

Nonpoint-source salinity in the Colorado River basin, predominantly associated with runoff and sediment yields from desert shrub communities, would decline less than in other areas because of the slow vegetation response to management.

Nonpoint sources of pollution from riparian areas would vary from the direct disturbance effects of continued livestock use. Even with an expected overall reduction in forage grazed, livestock would tend to congregate in and overgraze riparian areas. Fecal pathogens and nutrient enrichment directly correlated with livestock numbers would slightly decline or remain static. Sediment produced from trampling of streambanks and riparian areas would remain static or slightly increase over the long term. Past or current livestock use would produce sediment at or slightly above existing levels in stream-riparian systems with low-vigor riparian shrub and tree communities or unstable channels.

In summary, Current Management would not affect watersheds and water quality over the short term in local watersheds where livestock grazing is the main economic use. In the long term, however, where livestock grazing is the main economic use and where it occurs without appropriate controls or constraints, continued grazing could degrade the watershed and water quality. Degradation would continue if land management decisions are challenged in the courts and cannot be implemented until the issue is resolved. Within local ecosystems where livestock grazing is shared with other economic uses, Current Management would not affect watersheds or water quality in the short or long term.

## Wildlife

Current livestock grazing regulations would limit BLM to penalizing grazing permittees only for violating the Endangered Species and Bald Eagle Protection Acts. The Forest Service's much broader regulations, which cover most environmental protection laws and state wildlife laws, would in some cases benefit local wildlife populations.

Many water developments on public land for livestock grazing allow wildlife access through ramps or overflows. Where BLM does not control the water, livestock watering facilities are often shut off when livestock are absent but wildlife could use the facilities.



Private water users seeking exclusive control of a water source on public lands for livestock grazing purposes would reduce habitat quality by promoting wildlife-livestock conflicts. It is anticipated, that these direct effects would be related to the intensity of use around these extremely important water sources and the resultant reduction of vegetation cover and forage. Increasing distribution and intensity of livestock use related to water diversions would often increase the intensity of livestock-wildlife conflicts.

Current Management would have a slow, long-term adverse effect on wildlife as a whole and biological diversity in general. Species that depend mainly on upland communities may benefit and increase in some areas as upland communities continue to improve. But most wildlife would be harmed by the slow continual decline in the condition of riparian areas.

All management actions somewhat affect overall wildlife values. In many cases these effects lack significance when viewed individually from a broad wildlife perspective. But implementing many actions that in and of themselves lack significant effects, may have cumulative effects over time. For example, current management often allows water sources, (wells, pipelines, tanks) to be developed for livestock grazing where no water was historically present. Although new water developments for livestock grazing have traditionally been believed to benefit wildlife generally, overall ecosystem function is subtly changing. In some areas species that evolved without surface water are being replaced by water-dependent species, resulting in altered ecosystem interactions and reduced biological diversity. As these practices continue, these subtle changes would become more obvious and costly, potentially resulting in more listings of threatened or endangered species.

Similarly, effects resulting from several federal management actions in a given area may result in cumulative effects not anticipated by individual NEPA analyses completed for each proposed action. These cumulative effects could be potentially significant to wildlife, particularly special status plants and animals. Currently, no conflicting actions have been recognized, but some actions such as the possibility of implementing PACFISH (which is presently under development) and threatened or endangered species recovery plans might outweigh or negate the expected results of Current Manage-

ment. BLM and to a lesser extent the Forest Service's inability to apply consistent management in an ecosystem approach would contribute to the long-term decline in riparian-dependent wildlife, including waterfowl, fish, and raptors.

In the Columbia Basin and Coastal analysis areas, some of the options in PACFISH (which is presently under development), if adopted and implemented, would much more highly restrict grazing management options for meeting objectives for riparian and anadromous aquatic habitats. Some provisions of PACFISH could significantly improve anadromous fisheries, and could overshadow implementing the Current Management alternative in managing riparian and aquatic resources.

## Big Game

Land treatments and natural events would maintain the local diversity for big game habitat. General vegetation changes would favor species associated with upper seral stages. For example, in areas occupied by elk and mule deer, elk would be favored where vegetation moves toward a higher percentage of grasses. In the long term, big game populations would then move toward stability, but the proportion of habitats they would occupy would differ from what they now occupy. These vegetation trends would benefit bighorn sheep and elk, whereas pronghorn antelope and mule deer habitat conditions would generally decline due to a shift from brushy to herbaceous vegetation.

The quality of habitat would decline for riparian-dependent big game (see Figures 4-4 and 4-5), which would be less capable of maintaining populations. These species would have to rely on other, less-desirable habitats to replace riparian habitat component functions. For example, mule deer depend on riparian habitat for thermal and hiding cover provided by both vertical and horizontal vegetation structure and seasonally prolonged availability of succulent forage. These areas are especially important during fawn rearing. Dry and wet meadows provide valued foraging areas for bighorn sheep.

## Upland Game and Nongame

In the long term, Current Management would slightly improve upland and nongame



populations associated with improved upland range conditions in some areas, especially for species inhabiting higher elevation rangelands that receive more precipitation and respond faster to favorable management actions. This improved condition would stabilize but not increase existing nongame diversity. Some arid habitats would have no detectable long-term change.

Current Management has improved riparian habitats in limited areas, but projections show a long-term loss of functioning riparian areas. The amount of local recovery would not offset the overall downward trend of functioning riparian areas. This reduction in quality of riparian habitat would result in reduced abundance and diversity of upland and nongame.

## Waterfowl

BLM and the Forest Service would continue to apply a variety of policies and resource management practices that would continue a slight long-term decline of waterfowl habitat on 3.9 million acres of riparian-wetland habitat and lake and reservoir surfaces and 112,000 miles of streams. The decline in waterfowl populations would parallel the long-term decline of the quality of riparian and aquatic habitats.

This decline would result from livestock damaging soil structure and residual plant cover by hoof action and trampling, and removing palatable protective plant cover, thus allowing unpalatable species to increase. Removing and trampling residual plant cover would reduce nesting attempts, brood rearing success, and waterfowl productivity.

## Raptors

Under Current Management, many raptor populations have declined (Olendorff and Kochert 1992), including riparian-wetland-dependent raptors, such as the northern harrier. Upland-dependent raptors, such as ferruginous hawks, have slightly increased.

Habitat conditions change slowly in arid uplands. A slight improvement in uplands would little increase populations of raptors that depend on the drier upland habitats for hunting: ferruginous hawks, golden eagles, prairie falcons, and burrowing owls.

The long-term decline in the quality of riparian habitat would result in overall long-term

declines for raptor populations associated with large woody riparian vegetation such as cottonwoods and aspens. In riparian habitats where large woody vegetation was never a part of the normal vegetation composition, raptor populations would not significantly change.

Many cottonwood riparian habitats consist of only scattered mature and overmature trees with no young trees being established. Habitat improvement without rest from grazing would be difficult to achieve. In some riparian habitats woody vegetation was a part of the presettlement condition but is now absent because of livestock grazing and other less widespread actions. These areas would not recover in the short term. Often more than 20 years would be needed to return them to cottonwood gallery forests, improving nesting and fledgling habitat for riparian-dependent raptors. These slow riparian habitat improvements would benefit species like red-tailed hawk, Swainson's hawk, merlin, great-horned owl, common black-hawk, and the sharp-shinned hawk.

## Resident and Anadromous Fish

Under Current Management, the current slightly upward trend in range condition ratings would continue in the uplands, resulting in slightly better watershed condition and improved water quality for resident fish. But current trends would continue on 3.2 million acres of riparian habitat, and most aquatic habitats would decline because of livestock concentrating in these areas. Riparian and fishery habitat improvement projects would continue on a limited number of showcase or high-profile areas.

Current Management would significantly improve only about 20 percent of the anadromous fish habitats on federal rangelands or habitats now rearing federally listed endangered and threatened anadromous fish. These populations would stabilize or even increase over the long term. Elsewhere, habitat condition would continue to be static or decline. In such areas, populations of many anadromous stocks would continue their present downward trends.

The declines would result from a combination of effects: habitat degradation, interbreeding with hatchery fish, competition with non-native fish, overfishing, migration route blockage, increased predation on young fish, and increased isolation and fragmentation of suitable spawning habitats. The prospects of long-term



population persistence would likely decrease for many anadromous fish stocks. Continued lack of habitat recovery on federal rangelands would contribute to overall declines because streams affected by grazing (low-gradient, meadow streams) make up a significant proportion of the sensitive environment used by salmon for spawning and rearing in the Northwest.

## Special Status Species

As riparian habitats continue to trend away from proper functioning condition, more species dependent on these habitats would be listed. For example, declines in the condition of riparian habitats, especially those with canopies of uneven-aged cottonwoods or other large riparian trees, would reduce habitat for the endangered bald eagle.

Current Management generally focuses on the recovery of species in occupied habitats rather than on managing for habitats where species no longer exist. Conservation efforts are generally localized, focusing on specific areas. In the long-term recovery of some listed species is expected in these areas following trends predicted for vegetation changes.

Most appealed grazing decisions would not be immediately placed in full force and effect. Short-term delays in implementing decisions could result in the incidental "take" of species in limited areas where management changes are attempted to protect or increase special status species. The term "take" is defined by the Endangered Species Act as follows: to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.

## Wild Horses and Burros

The development of water sources on public lands has an impact on wild horse and burros. Changes in the management of water and other range improvements, such as placing restricting barriers around waters, can have a negative impact on wild horses and burros. Wild horses and burros might have to move to other water sources and compete for water with other grazing animals, including other wild horses. Overgrazing and damage to uplands and riparian or aquatic areas would result.

The concentration of more wild horses or burros would cause social behavior or interaction problems between bands, resulting in injuries, stress, and susceptibility to disease. These problems could in turn result in aborted foals and even the death of adult animals. To survive, wild horses and burros might be forced to use areas outside their herd areas.

The influence of grazing advisory boards with a focus on livestock production would continue to discourage wild horse and burro considerations in local resource management. Grazing advisory boards would continue to strongly influence type, location, design of range improvements, and spending of Range Betterment Funds.

The upward trends in upland vegetation previously described would benefit wild horses and burros through improved forage conditions.

## Recreation

Livestock grazing on federal lands would continue to affect scenic values, user experiences, and user permits at developed and undeveloped recreation sites. Most developed recreation sites are fenced from livestock and usually have a more natural setting and more vegetation than unfenced sites. Livestock, however, tend to concentrate along fences, and concentration of livestock use would lower scenic quality by creating fence-line contrasts, denuding areas, and causing erosion by trailing.

The water quality of streams flowing through recreation sites would continue to decline, resulting in lower quality user experiences. The scope and amount of facility maintenance would increase as a result of soil erosion and livestock rubbing on fences. The presence of livestock, fecal matter, foul odors, and increased insects would degrade unfenced developed sites, assaulting some users' sense of aesthetics and creating health risks. Existing range improvements, poor vegetation, and soil erosion might constrain the developing of future recreation sites.

Since most people prefer camping within sight of water, undeveloped recreation sites lie mostly in riparian areas, where livestock lower both scenic values and the quality of user experiences. Under Current Management, livestock would affect undeveloped sites just as they would developed sites.



Range improvements, such as vegetation manipulation, would tend to degrade scenic qualities. Fenceline contrasts would also increase over time as more fences are built. Fences would inhibit the freedom of movement by motorized and nonmotorized users.

Commercial recreation would continue to be harmed. Some guides and outfitters say that grazing practices reduce the marketability of their services. Customers complain about the livestock and their adverse effects. This problem would worsen in the long term as user demands and sensitivity increase. Opportunities for guides and outfitters would be constrained by the downward trend in riparian conditions (see Figures 4-4 and 4-5), which would make streams less navigable and fishable.

Current management would also constrain single-event recreation permittees as range improvements, especially fences, would continue to restrict freedom of movement.

Historic grazing-related structures such as settlement-era corrals, cabins, barns, and other buildings would add to the scenic character of landscapes. And livestock themselves create a pastoral scene appreciated by some viewers. This limited aspect of the scenic value would remain unchanged in the short term but would decline in the long term as historic structures are lost.

## Wilderness

The presence of range improvements in wilderness and wilderness study areas (WSAs) would lessen naturalness and primitive values, disturbing solitude and unconfined recreation. The concentration of livestock in riparian areas and in some uplands would degrade vegetation and water quality and result in a lower quality recreation experience and a loss of research opportunities. The presence of livestock would also increase the possibility of undesirable plants being introduced and established.

## Cultural and Paleontological Resources

The general condition trends of cultural resources reported in Chapter 3 resulted not only from the building of range improvements but also from the cumulative direct effects of livestock grazing. Under Current Management, grazing permits would continue to inconsistently

protect significant cultural resources from livestock grazing and construction of range improvements.

The Forest Service would suspend or cancel grazing permits for violations of cultural resource laws and regulations, but BLM would apply such penalties only for violations of the Bald Eagle Protection Act and the Endangered Species Act.

Because of their fragility, cultural resources could be damaged or destroyed by activities that modify the landscape. In riparian zones, where cultural resource sites and livestock tend to be concentrated, these sites would be most vulnerable. They would be damaged by trampling and susceptible to later loss through erosion. Overgrazing in riparian areas would also cause the loss of native food-source plants that provide lifeway values for Native Americans.

Upland cultural resources would be affected by concentrated grazing as described above but on a smaller scale. The building of range improvements in uplands, especially land treatment projects that disturb large areas, would destroy or modify cultural sites and also destroy some native food-source plants. Access developed for building many range improvements would increase the accessibility of these areas to all users. Cultural site values would then become susceptible to loss by vandalism, theft, impact from vehicles, and loss of integrity through altering natural settings. The tendency for livestock to rub against objects would damage historic structures and rock art.

Under Current Management, Range Betterment Funds would be used strictly for on-the-ground range improvements and not for project planning to inventory and evaluate potentially affected cultural resources.

Current Management would have the same effects on paleontological resources as on cultural resources.

## Economic Conditions

The impacts under Current Management, analyzed across a range of fee levels, result from a variety of trends affecting agriculture in general and livestock production in particular. (These trends are discussed in Chapter 3.) In addition, a variety of emerging issues might accelerate or offset ongoing trends in agriculture in the future.



Population growth and demographic changes in the West and in many western rural communities would continue to transform rural economies. Population growth in many rural communities, while contributing to economic growth and diversification, would continue to diminish the relative importance of agriculture in those communities. But economic diversification also offers more chances to earn off-ranch income and helps families maintain their ranches. Communities that continue to lose population and whose economies are in decline may be further strained by decreases in livestock production.

Land use changes, such as increased recreation use and subdivision of privately owned ranch lands, are both a cause and a result of trends in agriculture. Economically marginal ranches might be encouraged to sell to developers where the demand for rural homesites is increasing. As a result, agricultural production would further decline. Increased outfitter and guide activities, which encourage more recreational use of rural areas and offer more income-earning potential to ranches, might contribute to population growth and in turn accelerate changes in land use away from agriculture.

Land use changes could affect community tax bases. The impact to a local economy of a change in livestock production depends on the relative size and growth trends in other sectors of that economy. Where a relatively significant livestock industry declines, tax revenues have a high probability of declining. On the other hand, where other sectors of the economy are stable or growing and a relatively small decline occurs within a large livestock industry (or a large decline occurs within a small livestock industry), major impacts to the tax base are unlikely.

Changes in land use may accelerate the decline in public access to public lands where access depends on crossing private lands. Reduced access may increase the demand for land adjustment (such as land exchanges or easement acquisition) by BLM and the Forest Service to obtain more access to public lands.

Policies aimed at recovery of endangered species such as desert tortoises, anadromous fish, and grey wolves, would continue to affect livestock production by restricting livestock grazing in endangered species habitat. On the other hand, future activities designed to avert habitat

loss and endangered species listings may help sustain livestock production in the long term.

Eliminating the Federal Government's wool subsidy program over the next 3 years could accelerate the decline in sheep production in the West and may cause marginal sheep producers to sell their operations. Other government policies, such as trade agreements aimed at reducing international trade barriers, will also continue to affect the industry. Agreements of this kind may both increase and decrease livestock production, but the direction and magnitude of these impacts is beyond the scope of this EIS. The expiration of Conservation Reserve Program (CRP) contracts beginning in 1996 might encourage the use of croplands for pasture, thereby increasing forage for livestock.

The most important direct and indirect economic effects that would result from implementing this alternative are discussed in the following sections.

## Regional Economic Impacts

This section describes estimated economic impacts to employment and income at the westwide (17 western states) level. Effects on employment and income would stem from two sources: reduced forage for livestock use and increased grazing fees for the remaining forage. Appendix N, MicroIMPLAN System and Methodology for Estimating Impacts to Employment and Income, describes the methodology used to assess the economic impacts.

Under Current Management, grazing use levels would decline by an average of 1 percent per year. These declines are based on trends over the past 10 years, which are projected to continue. Thus, federal forage grazed by livestock would decline 5 percent over 5 years and by 20 percent over 20 years.

Employment and income impacts would be minor relative to current conditions and trends in the westwide economy as a whole and in the agriculture sector in particular. The economic impacts would occur in the context of a western economy that has shown consistent growth over the past 10 years and is expected to continue growing. Thus, continued growth in employment and income in other sectors would tend to overshadow the relatively small employment and income reductions from declines in livestock AUMs on public lands.



Table 4-1 shows the employment and income effects of the decline in livestock grazing under Current Management across all fee levels. After 5 years, employment in the 17 western states is estimated to decline by 710 to 1,820 jobs<sup>1</sup> (about 0.05 percent of total westwide agricultural employment under the current PRIA fee alternative 1, or 0.12 percent under regional-fees and competitive bidding, fee alternatives 4 and 7 respectively). Under the BLM-Forest Service proposed fee formula (fee alternative 3), the decline is estimated to be between 1,111 to 1,230 jobs, or about .07 percent to 0.08 percent of total westwide agricultural employment. After 20 years, employment is estimated to decline by a range of 2,640 (jobs under the current PRIA fee) to 3,580 jobs (under regional fees and competitive bidding). Under the BLM-Forest Service fee proposal, the decline would amount to 3,080 jobs. The 20-year declines across all fee levels make up about 0.02 percent of total agricultural employment westwide. Job losses at all fee levels, however, would be insignificant at the westwide level. Some of the projected declines in employment would be absorbed through retirements and people seeking other types of work in the normal course of their lives.

Total income after 5 years is estimated to decline by a range of \$28.7 to \$69.9 million. (Under the current PRIA fee about 0.1 percent

of total agricultural income westwide; under regional fees and competitive bidding about 0.2 percent.) Under the BLM-Forest Service fee proposal the decline would be between \$43.5 million and \$48.1 million (less than 0.2 percent) (see Figure 4-5a).

Total income after 20 years is estimated to decline by a range of \$106.7 to \$141.5 million. (Under the current PRIA fee about 0.3 percent of total agricultural income westwide; under regional fees and competitive bidding about 0.4 percent). Under the BLM-Forest Service fee proposal, the decline is estimated to be between \$119.3 and \$123.1 million (about 0.4 percent of total agricultural income westwide)(See Figure 4-5a). Table 1 in Appendix P, Change in Employment and Income After 5 Years and 20 Years of Implementation Under Different Fee Levels, contains more detailed information on employment and income impacts.

The location and intensity of impacts cannot be easily estimated. For example, over the long term in the Columbia Basin analysis area, BLM and Forest Service forage is estimated to decline by only 10 percent as opposed to 20 percent westwide. Forest Service forage in the Coastal analysis area would decline by a greater-than-average 30 percent over the long term. This 30 percent decline is not expected to create significant economic impacts since only 2 percent of total forage grows in that analysis area.

The impacts from reduced forage do not consider other factors that could mitigate overall impacts. For example, declines in employment and income from livestock forage reductions do not consider adjustment periods for phasing in higher grazing fees over a 3-year pe-

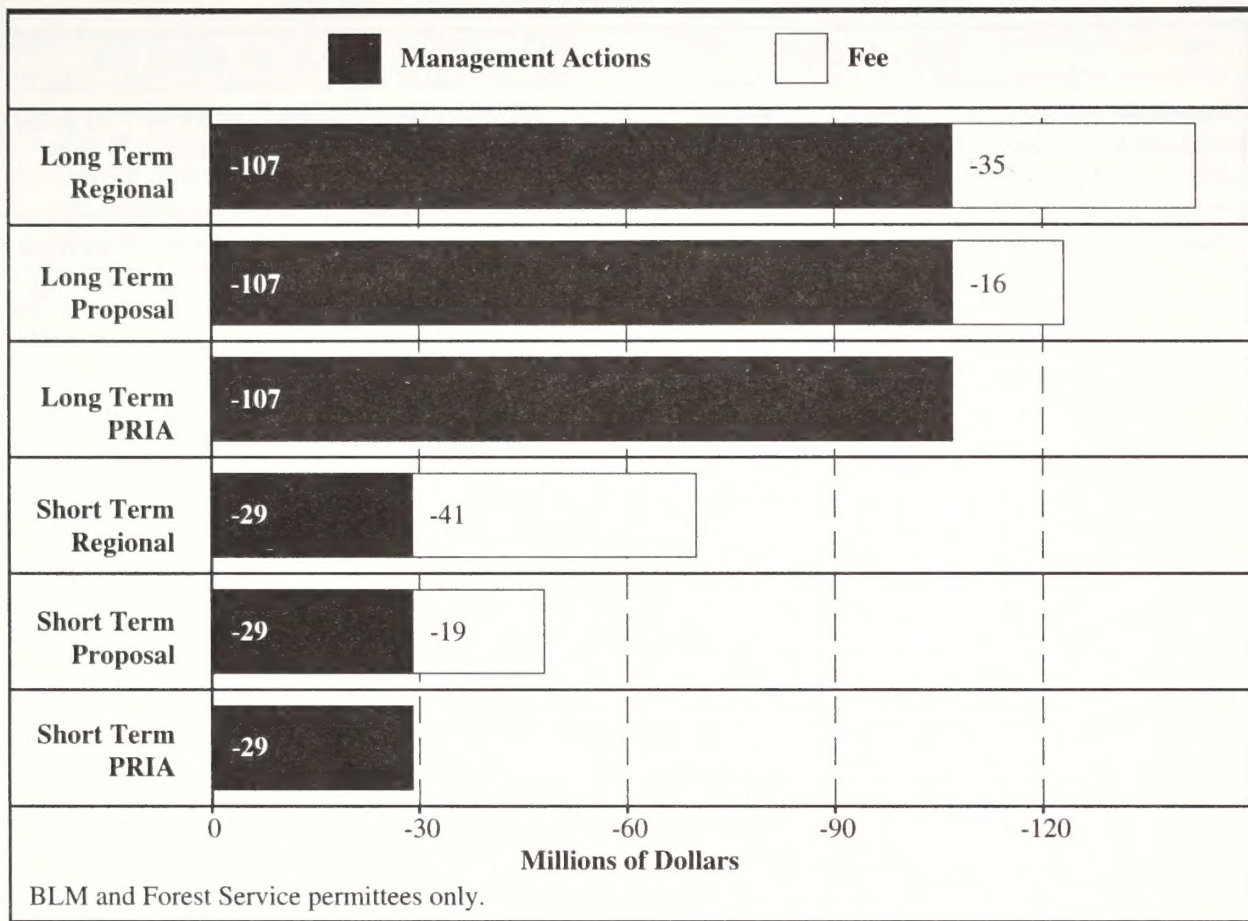
<sup>1</sup> The impacts for the BLM/Forest Service Proposed Fee are presented as a range between those caused by a \$4.28 fee and those caused by a \$3.72 fee. See **Assumptions and Analysis Guidelines** for more information.

	Fee Level						
	PRIA (Current)	Modified PRIA	BLM/FS Proposed	Regional	FFF	PRIA with Surcharge	Competitive Bidding
<b>Decreased Employment</b>							
After 5 Years	710	1,104	1,233	1,822	813	1,111	1,822
After 20 Years	2,643	2,975	3,084	3,579	2,729	2,981	3,579
<b>Decreased Income (1993 \$)</b>							
After 5 Years (\$000)	\$ 28,667	\$ 43,263	\$ 48,060	\$ 69,883	\$ 32,463	\$ 43,508	\$ 69,883
After 20 Years (\$000)	\$106,747	\$119,038	\$123,078	\$141,455	\$109,943	\$109,943	\$141,455





**Figure 4-5a: Reductions in Income - Livestock Industry, Current Management**



riod or longer. Phasing in a higher fee would reduce the short-term impacts. Nor do these impacts account for the economy's ability to absorb gradual changes in grazing use levels over time (i.e. 1 percent per year over 20 years) as opposed to a sudden 20 percent decline in forage in 1 year. Further, increases in Range Betterment Funds from higher grazing fees may improve wildlife and fisheries habitat, thus increasing recreational opportunities and related economic activity.

### Ranch Income and Operation Impacts

This section describes the impacts to ranch operations and ranch income resulting from changes in livestock grazing on federal lands and increases in grazing fees. Impacts are described for three hypothetical herd sizes: 425 cows, 210 cows, and 90 cows. Impacts are also considered

for two levels of federal forage dependency for each of these three operations: 60 percent and 30 percent. Appendix O, Changes in Ranch Returns from Reduced AUMs and Higher Grazing Fees, describes the methodology used to assess the impacts to ranch operations.

One impact common to all alternatives in this EIS is that herd sizes would decrease as access to federal forage is reduced (although the extent of the decreases would vary by alternative, depending on the reduction in federal forage). Further, all else being equal, net cash return would decrease as herd sizes decrease.

Under Current Management, federal forage grazed by livestock would decrease by 5 percent after 5 years and by 20 percent over 20 years. A westwide average, these figures do not necessarily represent the forage reductions estimated for all ranching operations. Table 4-2 shows the losses in net cash returns (cash receipts minus expenses) to the six hypothetical operations over the short and long term as a result of reduced





**Table 4-2: Impacts to Range Operations under Current Management**

Alternative 1: Current Management	Ranch Attributes			Herd Impacts	Net Cash Returns Lost		
	Herd Size	Percent Dependency on Federal Forage	Percent AUM Reduction	# of Cows Lost Per Permitted Herd	Due to Smaller Herd Size <sup>1</sup>	At \$3.96/AUM <sup>2</sup>	At \$6.38/AUM <sup>3</sup>
Year 5	425	60.0	5.0	13.3	\$1,144	\$8,179	\$14,284
	425	30.0	5.0	6.6	568	4,085	7,138
	210	60.0	5.0	6.6	568	4,044	7,061
	210	30.0	5.0	3.3	284	2,022	3,530
	90	60.0	5.0	1.0	86	1,576	2,869
	90	30.0	5.0	0.5	43	788	1,434
Year 20	425	60.0	20.0	53.0	4,558	10,482	15,623
	425	30.0	20.0	26.5	2,279	5,241	7,811
	210	60.0	20.0	26.2	2,253	5,180	7,720
	210	30.0	20.0	13.1	1,127	2,591	3,861
	90	60.0	20.0	4.0	344	1,599	2,687
	90	30.0	20.0	2.0	172	799	1,344

<sup>1</sup> Net cash returns lost at current fee level.

<sup>2</sup> Net cash returns lost due to herd size reductions plus increased fee (to \$4.28/AUM) on remaining federal forage. This analysis for the BLM/Forest Service Proposal of \$3.96 is based on a \$4.28 fee. \$4.28 is the value that would be produced with a FVI of 1.08 instead of an FVI of 1 as proposed. See **Assumptions and Analysis Guidelines** for more information. The impacts presented here are overstated by 3 to 12 percent, depending on the management alternative.

<sup>3</sup> Net cash returns lost due to herd size reductions plus increased fee (to \$6.38/AUM) on remaining federal forage. \$6.38/AUM is the average value of the regional fees (weighted by the number of AUMs in each state charged at each fee level).

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forage. These impacts are shown for the current PRIA fee level (\$1.86), the BLM-Forest Service proposed formula (\$3.96)<sup>2</sup>, and the weighted average regional fee level (\$6.38).

In this analysis, the herd size of 425 cows and a 60 percent dependency on federal forage would be most affected. In the short term, a 5 percent reduction in forage at the current fee level would decrease net cash returns by \$1,100. At \$3.96/AUM, net cash returns would decline

by \$8,200 in the short term. And, at \$6.38/AUM, net cash returns would decline by \$14,300 in the short term.

In the long term, a 20 percent reduction in forage at the current fee level would decrease net cash returns by \$4,600. At \$3.96/AUM, net cash returns would decline by \$10,500 in the long term. And, at \$6.38/AUM, net cash returns would decline by \$15,600 in the long term.

This operation, with a herd size of 425 and 60 percent dependency on federal forage, is assumed currently to use 3,060 animal unit months (AUMs) (425 \* 12 months \* 0.6). The operation would use 2,900 AUMs after 5 years and 2,450 AUMs after 20 years. Although the income impacts might be significant for this and

<sup>2</sup> The analysis for the BLM/Forest Service Proposal is actually based on a \$4.28 fee. \$4.28 is the value that would be produced with a FVI of 1.08. See **Assumptions and Analysis Guidelines** for more information.



other operations with a large amount of federal AUMs, only 8 percent of BLM permits and 4 percent of Forest Service permits authorize more than 2,000 AUMs. Seventy-five percent of BLM permits and more than 50 percent of Forest Service permits allow no more than 500 AUMs.

The 90-cow operation with a 60 percent federal forage dependency depicted here is most closely associated with the permit size category of 500 or fewer AUMs. This operation is assumed now to use 650 AUMs ( $90 * 12 \text{ months} * 0.6$ ). The 210-cow operation with 30 percent dependency and about 760 AUMs is also representative of this permit size category.

Although the main adjustment permittees make to reduced federal forage would be to decrease their herd sizes, several other responses are possible: substituting other forage (leasing more private pasture), using supplemental feed (hay), increasing the productivity of private lands (pushing ditches further up the sideslopes or installing wells and center pivot sprinkler systems to increase vegetation on private property), or reserving vegetation for livestock that now goes to wildlife (fencing elk off bottomlands so cattle have exclusive use; encouraging federal agencies and state game officials to install wildlife bait stations to keep elk and deer in the uplands to reduce competition for forage). These responses could somewhat offset losses of federal forage.

Reductions in federal forage would tend to have a greater effect on permittees most highly dependent on federal forage to meet their total feed requirements. The impact of the reductions would vary with the financial condition of the ranch. Unprofitable operations would be further stressed by reductions in federal forage and higher grazing fees. The more profitable an operation, the greater its ability to deal with higher fees and reduced access to federal forage.

The effect of reduced federal forage and higher grazing fees would also depend on a ranch's flexibility in finding and purchasing alternative forage sources. Ranches with the fewest alternatives and least flexibility would reduce their livestock the most. Even ranches not greatly dependent on federal forage could be stressed by forage reductions if they cannot find suitable and affordable alternative forage.

The impacts of reduced federal forage and higher grazing fees could be somewhat lessened by phasing in an increase in grazing fees over a

3-year period or longer. Additionally, the gradual reduction in federal forage over the long term would also give permittees a chance to adjust their operations. Other potential mitigating measures that could lessen impacts would be a two-tiered grazing fee system under which small family ranches might pay a lower fee than larger commercial ranches, or an incentive-based fee system under which permittees would be given financial or other incentives for good stewardship practices. Increases in Range Betterment Funds resulting from higher grazing fees might also help mitigate losses to ranches by funding more improvements that benefit livestock.

### Grazing Fee Receipt and Payment Impacts

Table 4-3 shows changes in grazing fee receipts under Current Management at all fee levels. Under the current PRIA fee, receipts would decline by 5 percent over 5 years (\$1.5 million) and 20 percent over 20 years (\$6.2 million) from current conditions.

Under all other fee levels, grazing fee receipts would increase over current conditions. The federal forage fee (alternative 5) would generate the lowest increases over time: \$6.3 million in 5 years (21 percent) and \$468,000 in 20 years (2 percent). Regional fees (alternative 4) would generate the greatest increases over time: \$69.5 million in 5 years (226 percent), and \$53.7 million in 20 years (174 percent). The BLM-Forest Service fee proposal (alternative 3) would generate increases between these two extremes: \$36.5 million in 5 years (119 percent, or slightly more than double over the current estimated level of receipts of \$30.8 million), and \$25.9 million in 20 years (84 percent).

Table 4-3 shows the distribution of receipts to Range Betterment Funds, payments to states and counties, and revenues to the U.S. Treasury. Assuming that the distribution of grazing fee receipts remains the same, these three categories would increase by the same percent. Table 4-3 also shows grazing fee receipts separately for both BLM and the Forest Service.

For total grazing fee receipts under all fee levels, see Table 1 in Appendix Q, Current Management: Total Grazing Fee Receipts After 5 Years and 20 Years Under Different Fee Alternatives.



**Table 4-3: Current Management: Change in Grazing Fee Receipts after 5 Years and 20 Years under Different Fee Alternatives (Millions of 1993 \$)**

	Current		Current PRIA Fee		Modified PRIA Fee		Proposed Action Fee		Regional Fees and Competitive Bidding		Federal Forage Fee		PRIA with Surcharge		
	Current	5 Years	20 Years	5 Years	20 Years	5 Years	20 Years	5 Years	20 Years	5 Years	20 Years	5 Years	20 Years	5 Years	20 Years
Range Betterment Fund (RBF)	\$15.39	\$14.62	\$12.31	\$29.01	\$24.43	\$33.64	\$28.33	\$50.15	\$42.23	\$18.55	\$15.62	\$29.24	\$24.62		
BLM	\$9.47	\$8.99	\$7.57	\$17.84	\$15.02	\$20.69	\$17.42	\$30.84	\$25.97	\$11.41	\$9.61	\$17.98	\$15.14		
USFS	\$5.92	\$5.63	\$4.74	\$11.16	\$9.40	\$12.95	\$10.90	\$19.30	\$16.25	\$7.14	\$6.01	\$11.25	\$9.48		
Payments States/Countries	\$6.00	\$5.70	\$4.80	\$11.30	\$9.52	\$13.11	\$11.04	\$19.54	\$16.45	\$7.23	\$6.09	\$11.39	\$9.59		
BLM	\$3.32	\$3.16	\$2.66	\$6.26	\$5.27	\$7.26	\$6.11	\$10.82	\$9.11	\$4.00	\$3.37	\$6.31	\$5.31		
USFS	\$2.67	\$2.54	\$2.14	\$5.04	\$4.25	\$5.85	\$4.92	\$8.72	\$7.34	\$3.22	\$2.72	\$5.08	\$4.28		
Receipts to Fed Treasury	\$9.39	\$8.92	\$7.51	\$17.70	\$14.91	\$20.53	\$17.29	\$30.61	\$25.77	\$11.32	\$9.54	\$17.85	\$15.03		
BLM	\$6.14	\$5.84	\$4.92	\$11.58	\$9.75	\$13.43	\$11.31	\$20.02	\$16.86	\$7.41	\$6.24	\$11.67	\$9.83		
USFS	\$3.25	\$3.09	\$2.60	\$6.12	\$5.16	\$7.10	\$5.98	\$10.59	\$8.91	\$3.92	\$3.30	\$6.17	\$5.20		
<b>Total</b>	\$30.78	\$29.24	\$24.62	\$58.01	\$48.85	\$67.28	\$56.66	\$100.29	\$84.46	\$37.10	\$31.25	\$58.48	\$49.25		
BLM	\$18.93	\$17.98	\$15.14	\$35.68	\$30.05	\$41.38	\$34.85	\$61.69	\$51.95	\$22.82	\$19.22	\$35.97	\$30.29		
USFS	\$11.85	\$11.25	\$9.48	\$22.33	\$18.80	\$25.90	\$21.81	\$38.60	\$32.51	\$14.28	\$12.03	\$22.51	\$18.96		
BLM	\$18.93	\$17.98	\$15.14	\$35.68	\$30.05	\$41.38	\$34.85	\$61.69	\$51.95	\$22.82	\$19.22	\$35.97	\$30.29		
RBF	\$9.47	\$8.99	\$7.57	\$17.84	\$15.02	\$20.69	\$17.42	\$30.84	\$25.97	\$11.41	\$9.61	\$17.98	\$15.14		
Payments States/Countries	\$3.32	\$3.16	\$2.66	\$6.26	\$5.27	\$7.26	\$6.11	\$10.82	\$9.11	\$4.00	\$3.37	\$6.31	\$5.31		
Receipts to Fed Treasury	\$6.14	\$5.84	\$4.92	\$11.58	\$9.75	\$13.43	\$11.31	\$20.02	\$16.86	\$7.41	\$6.24	\$11.67	\$9.83		
USFS	\$11.85	\$11.25	\$9.48	\$22.33	\$18.80	\$25.90	\$21.81	\$38.60	\$32.51	\$14.28	\$12.03	\$22.51	\$18.96		
RBF	\$5.92	\$5.63	\$4.74	\$11.16	\$9.40	\$12.95	\$10.90	\$19.30	\$16.25	\$7.14	\$6.01	\$11.25	\$9.48		
Payments States/Countries	\$2.67	\$2.54	\$2.14	\$5.04	\$4.25	\$5.85	\$4.92	\$8.72	\$7.34	\$3.22	\$2.72	\$5.08	\$4.28		
Receipts to Fed Treasury	\$3.25	\$3.09	\$2.60	\$6.12	\$5.16	\$7.10	\$5.98	\$10.59	\$8.91	\$3.92	\$3.30	\$6.17	\$5.20		



## Social Conditions

### Permittees

In the short term under Current Management, losses in income experienced by the average permittee (with a herd size of 210 cows and a 30 percent dependency rate) would be \$284 annually at the current fee level; \$2,022 at \$3.96/AUM; and \$3,530 at \$6.38/AUM. In the long term, the losses for the same average permittee would be \$1,127 annually in income at the current fee level; \$2,591 at \$3.96/AUM; and \$3,861 at \$6.38/AUM. (See Table 4-2, Impacts to Ranch Operations Under Current Management.)

Some permittees would have greater losses than the average. Others would have smaller losses. The size of the loss for any permittee would depend on the size of the operation, the dependency on federal forage, the amount of forage lost, and the grazing fee. The effect of the loss on any individual permittee would vary by the size of the loss, the financial condition of the operation, and the dependence of the ranch family on the operation.

Losses in ranch income could result in declines in the economic well-being of affected permittees and their families. Lifestyle changes in response to the income loss could include families decreasing their spending, diversifying the operation to make it less dependent upon ranching, or sending family members to work off the ranch to bring in more income. Most permittees would try to adjust their operations to absorb the income losses rather than sell their ranches because maintaining the ranching lifestyle is important to them.

Under Current Management at the current fee level, losses in forage would continue the losses permittees are now experiencing. Permittees would have time to adjust to the long-term decline in forage. At the higher fee levels, income would decline. See the Social Conditions in the Impacts Common to All Alternatives section at the beginning of Chapter 4 for a discussion of the social consequences to permittees from lifestyle changes and reductions in income.

Rangeland Reform '94 scoping comments from many permittees and ranch industry representatives reported a belief that current management does not need a change in direction. Comments state that since the enactment of the Taylor Grazing Act, the Federal Land Policy Man-

agement Act of 1976, and the Public Rangeland Improvement Act of 1978, the condition of federal rangelands has consistently improved. Implementing Current Management would say to most permittees that the agencies managing the federal lands agree with their perception that management is progressing satisfactorily. Groups highly concerned about existing rangeland conditions, however, would disagree with this conclusion, and existing stressful interactions between these groups and ranchers would continue.

### Counties and Communities

Job losses at all fee levels would be insignificant on a westwide basis. Most of the projected decline in employment would be absorbed through retirements and people seeking other types of work in the normal course of their lives.

Westwide in the short term under Current Management, 710 jobs would be lost at the current fee level, between 1,111 and 1,230 jobs would be lost at \$3.96/AUM, and 1,820 jobs would be lost at \$6.38/AUM. In the long term, 2,460 jobs would be lost at the current fee level, 2,980 and 3,080 jobs would be lost at \$3.96/AUM, and 3,580 jobs would be lost at \$6.38/AUM. These losses represent jobs in all sectors of the economy—ranch employment as well as jobs directly and indirectly related to ranching. At the current fee level, these job losses represent a continuation of ongoing trends.

For some communities like the "typical small community" described in Chapter 3, Current Management at the current fee level represents a continuation of the ongoing trend of slow population loss. At the higher fee levels, the ongoing trend could be accelerated. The potential effects of job and population loss on local communities are described under Social Conditions in the Impacts Common to All Alternatives section at the beginning of Chapter 4.

The long-term decline in federal forage would not affect the social environment of larger communities such as Rawlins, Wyoming, and Gunnison, Colorado, because permittees and other residents would have time to adjust to the changes in forage. Grazing fee increases would be highest in areas with a high average dependency on federal grazing, such as Gunnison County. The effects of these fee increases would



depend on the financial condition of local ranches and local economic conditions. In areas where there are few permittees, the community population is large, and the economy is diverse, fee increases would be insignificant at the county and community level.

In many areas such as Carbon County, Wyoming, adopting the Current Management alternative is consistent with the desires of permittees and residents, who feel that range condition has been improving and Current Management should be continued. Even though recreation quality would decline in the long term under this alternative, most local recreationists and those promoting recreation as a way to diversify county economies would probably favor Current Management because permittees and the local community would not be greatly affected.

In other areas such as Gunnison County, some local recreationists and environmentalists might feel that more should be done to protect recreation, riparian, and wildlife resources. In the short term, differences in opinions and values could result in less cooperation and support among groups within these communities.

## National Impacts

Increasing numbers of people in the West and across the country believe that rangeland management should emphasize protecting rangeland resources rather than managing livestock. The Current Management alternative is inconsistent with these attitudes. People who disagree with the selection of the Current Management alternative might feel powerless toward and frustrated about government in general, BLM and the Forest Service, and the policymaking process.

Generally, recreationists and environmentalists would not support Current Management because of long-term declines in riparian and wildlife habitat and recreation opportunities, such as camping and fishing. The condition of these resources is important to these groups because they value these resources as potential recreation areas, and many appreciate just knowing that these areas exist and will continue to exist in the future.

Increasing numbers of people across the country, including some ranchers who are not permittees, believe that livestock grazing fees

should be increased. Raising grazing fees would be consistent with these attitudes.

## Alternative 2: Proposed Action

### Grazing Administration

#### Livestock Use Levels

Figure 4-6 shows potential short- and long-term levels of livestock use under the Proposed Action on BLM- and Forest Service-administered lands. These trends are based in part on current background trends and also on estimated condition levels of functioning, functioning but susceptible to degradation, and nonfunctioning acres of BLM uplands and riparian areas and Forest Service data on acres of land meeting or not meeting forest plan objectives.

After 20 years, authorized livestock forage would be 3 percent less than under current management. Contributing factors include stocking rate adjustments resulting from monitoring studies that indicate continuing resource damage and a declining economic feasibility of livestock grazing. Changes in forage authorization would also result from implementation of BLM state or regional standards and guidelines and recovery plans for listed threatened and endangered species. Livestock forage authorized by the Forest Service would be the same as under current management.

BLM's significant short-term reduction in forage authorized for livestock grazing would result from implementing standards and guidelines. Many areas would be classed as nonfunctioning and would have periods of rest incorporated into management schemes in the short term. Grazing would be reinstated as these areas move from nonfunctioning to functioning condition. Nonfunctioning areas would improve over the long term.

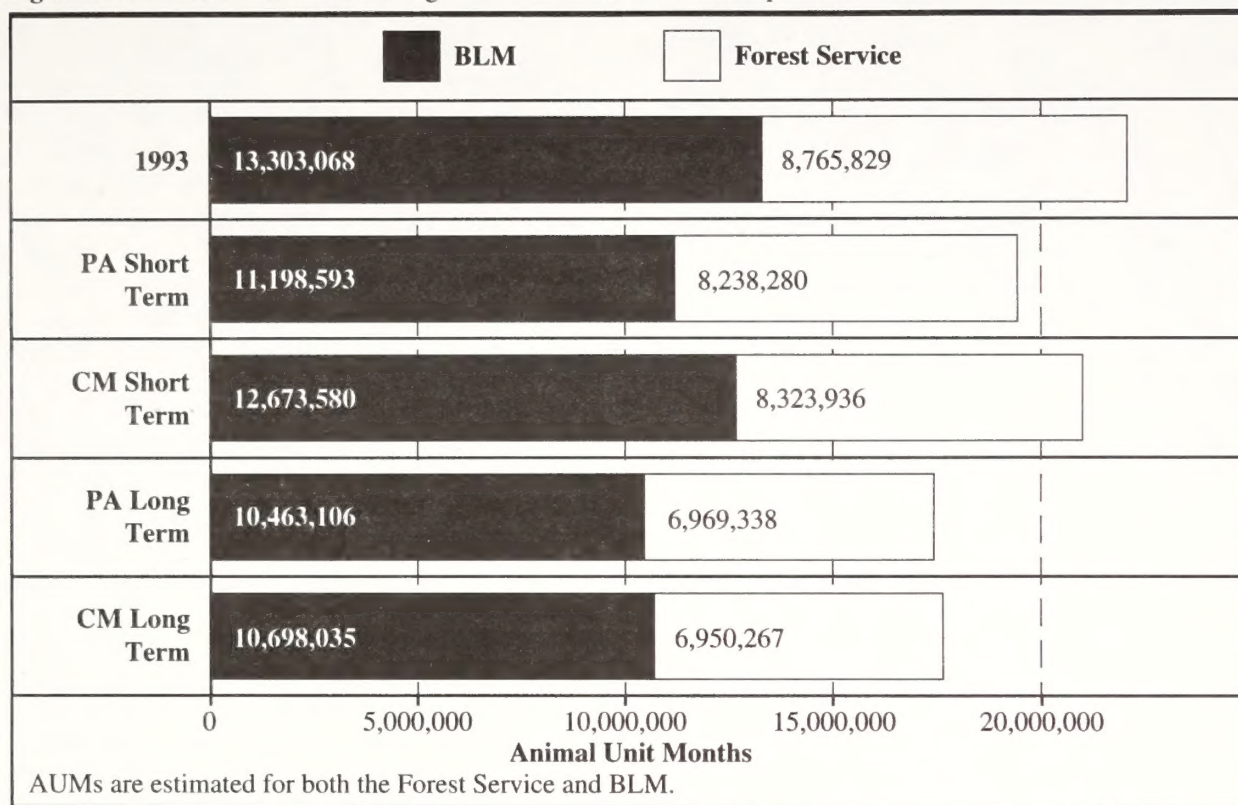
#### Program Efficiency and Effectiveness

BLM's workload would increase in the short term as it develops and implements regional standards and guidelines, including regional National Environmental Policy Act (NEPA) analy-





**Figure 4-6:** Available Livestock Forage in Animal Unit Months, Proposed Action



ses. But in the long term, regional standards and guidelines would help to focus BLM's management direction, promote biological diversity, and improve agency efficiency in meeting management objectives.

The Forest Service would strengthen its ability to implement forest plan standards and guidelines by making them a condition of grazing permits. Where there are no forest plan or site-specific project decision standards and guidelines to incorporate in the grazing permit, the Forest Service would issue a temporary permit for 3 years to allow livestock grazing to continue while standards and guidelines are developed. Developing standards and guidelines would be subject to National Environmental Policy Act and National Forest Management Act compliance. Continuing livestock grazing while standards and guidelines are being developed would not change environmental effects from those under Current Management. Incorporating standards and guidelines into a new term grazing permit would improve rangeland conditions.

More extensive and consistent public involvement would eventually help the agencies make decisions more reflective of (and accept-

able to) a wider range of public interests and thus might reduce appeals in the long term.

Several other proposed grazing regulation changes would allow BLM and the Forest Service to gain efficiency and consistency, although agency regulations for leasing and advisory groups would remain inconsistent. BLM's efficiency and effectiveness would improve as a result of proposed changes covering base property leases, livestock pasturing agreements, unauthorized use, appeal of grazing decisions, range improvement ownership, disqualification, and implementing of national requirements and regional standards and guidelines or the fallback standards and guidelines. The Forest Service would improve its efficiency and consistency by changing regulations and policies for unauthorized use, foreign corporations, eligibility for holding grazing permits, disqualification, and implementing ecosystem management principles.

In the short term the number of base property and livestock leases would decrease as surcharges discourage BLM permittees from entering into such leases. But as permittees adjust to the surcharges, the number of leases could re-



turn to current levels. The 3-year minimum requirement on base property leases would reduce the number of grazing permit transfers processed each year.

Forest Service livestock and land ownership requirements would not change, and BLM and Forest Service leasing fee regulations would remain inconsistent.

BLM and the Forest Service would increase their efficiency and reduce their administrative workload by using the authority for nonmonetary settlements where the unauthorized use is clearly incidental, only slight forage has been consumed, and natural resources have not been affected. This change would make BLM and Forest Service regulations and practice consistent.

The Forest Service would improve its ability to control repeated unauthorized grazing, although such problems are not widespread. Under the Proposed Action, the Forest Service could effectively penalize violators. In the long term the authority to issue harsher penalties should help deter repeated unauthorized use, resulting in an administrative workload more focused on cooperation. Most importantly, natural resources previously overused due to unauthorized use would recover and improve.

By defining authorized use to include livestock grazing, personal convenience nonuse, and conservation use, BLM would clarify to livestock permittees what is authorized. Permittees would not need to worry about losing their permits because of conservation use. The Proposed Action would also trim the administrative workload since conservation use would be incorporated into the conditions of grazing permits, thereby alleviating an annual assessment and approval. Forest Service regulations would not change, and the BLM's change would make its policies consistent with the Forest Service's.

Tracking and maintaining records of suspended nonuse would continue to create administrative inefficiency. Implementing procedures that would end the automatic staying of appealed decisions would allow most decisions to take effect within 75 days. This decrease in stayed agency decisions would allow the agencies to rapidly adjust forage allocations, revise prescribed management, and make other administrative changes needed to maintain the standards and guidelines. Forest Service appeal procedures would not change.

Few livestock permittees have violated federal regulations to the point of having their permits canceled. Not allowing those permittees to apply to BLM and the Forest Service for new permits after their old ones have been canceled would help eliminate the need for continual adverse actions. The possibility of not being able to hold a permit for 3 years would encourage better cooperation from these operators and result in improved cooperation between the agency and the permittee. Improved management would also reduce the amount of regulatory workload for dealing with poor stewardship and improve both agencies' abilities to implement prescribed management.

Including violations of other state and federal laws into BLM's definition of prohibited acts would deter BLM permittees from violating state and federal laws and standards. Few permittees violate these laws. Nevertheless BLM's workload could increase during the first 5 years, depending on the number violators, but taper off within the next 5 years as permittees become familiar with the regulations and understand the consequences of losing their permits for violations. The Forest Service already has this provision as part of its grazing permits, and the associated administration workload has not been significant.

Under the Proposed Action, both BLM and Forest Service permittees would have to show that they are good land stewards to qualify for additional animal unit months (AUMs) of forage. As a result, both agencies would have reduced administrative workloads, having to process fewer resource decisions, appeals, and administrative penalties because of improved permittee management.

Multiple resource advisory councils under the Proposed Action would make a more balanced contribution to BLM policy and decisionmaking than would grazing advisory boards under Current Management. The administrative workload would be lessened by fewer appeals from those who perceive that BLM has not considered all pertinent information when making its decisions.

The Forest Service would not have grazing advisory boards under the Proposed Action, but local Forest Service units could participate in BLM multiple resource advisory councils.

The change in policy on the ownership of rangeland improvements would at first discourage some BLM permittees from investing their



own money in range improvements and prevent BLM from spreading its Range Betterment Funds as far as it otherwise could. As a result, fewer improvements would be developed in the short term. But as the new policy becomes more accepted over time, long-term permittee investment would rise.

As more BLM offices become involved in ecosystem management, budget allocations would change. State Directors would have more flexibility in allocating funds to areas with the most critical needs, not only with Range Betterment Funds but other appropriated funds. Forest Service and BLM Range Betterment Fund allocation policies would then be consistent.

Initially, in implementing ecosystem management, more short-term work would be needed for developing agency initiatives and goals. In the long term, however, a more holistic and interdisciplinary process would more efficiently and equally address the needs of the environment and of public land users.

### **Availability and Use of Range Betterment Funds**

Under the Proposed Action, Range Betterment Funds going to BLM and the Forest Service would depend on the grazing fee formula selected for implementation. For example, if the current grazing fee formula is retained, Range Betterment Funds would decline by 21 percent (from a 3-year average of \$15.4 million per year to \$12.2 million per year) over the long term. This decline would result from a projected decline in livestock use on federal lands (discussed in the preceding section), and an accompanying decline in grazing fee receipts.

A 21 percent decline in Range Betterment Funds, assuming the grazing fee remains constant, coupled with rising costs for range improvements, would generally mean that far fewer range improvements could be built in the future. Furthermore, this funding would continue to be needed to rebuild existing projects where the agency has the responsibility.

Alternative sources of funding, including increased permittee contributions, agency appropriations, and contributions from other sources, would become more important just for maintaining the current level of management. Without such funding, some existing fences and water development for livestock grazing on pub-

lic lands would eventually fall into disrepair. Livestock use would become increasingly difficult to manage. Fewer allotment management plans would be implemented each year. And progress in meeting a wide range of resource management objectives would be slowed. Riparian habitat and other resource conditions would deteriorate at an accelerating rate, and this deterioration could eventually result in the need to reduce livestock use even more than currently projected.

But reduced funding would be somewhat offset by the agencies' having more flexibility to distribute funds to priority areas and more authority to use funds to meet more resource management priorities, including monitoring.

Under the BLM-Forest Service proposed grazing fee or regional fees, Range Betterment Funds would increase by 82 percent (to \$28 million per year) or 171 percent (to \$41.7 million per year), respectively. Such large increases in these funds would more than offset rising range improvement costs and would generally mean that more range improvements could be built, maintained, and rebuilt. Such increased funding would be coupled with expanded authority to use Range Betterment Funds to meet a wider range of priorities and more flexibility in distributing funds to priority areas. As a result, monitoring of resource conditions could increase, and the agencies could invest in large restoration projects, such as the conversion of extensive stands of cheatgrass or other noxious weeds.

Over the long term, higher funding levels would greatly increase the agencies' abilities to implement, maintain, and monitor the effectiveness of range improvements for achieving more resource management objectives than are now possible. The need for alternative sources of funding would correspondingly decrease.

### **Vegetation**

Under the Proposed Action, conservation use would help improve upland and other vegetation conditions. Instead of adjusting permit conditions through the decisions and appeals process, the agencies could make extended nonuse a condition of grazing permits and use it as a management tool.

Fifty percent of BLM Range Betterment Funds available for range improvements would



be allocated according to state priorities, leading to faster improvement of ecosystem health and biodiversity. Currently, 50 percent of Range Betterment Funds in the Forest Service can be allocated by regional foresters.

By permitting Range Betterment Funds to be used for project planning and environmental analysis, the Proposed Action would allow for faster implementing of priority projects. Using funds for monitoring would ensure that projects are effective and would improve future planning of similar projects. Using funds to meet all resource management objectives on federal rangelands would allow spending based on ecosystem management priorities rather than mainly for livestock management needs. This change in priority would increase the consideration of biodiversity on federal rangelands.

Expanded opportunities for a broader range of public involvement would increase the diversity of viewpoints and ideas, which would lead to recognizing more opportunities for grazing management to meet local and site-specific objectives for upland vegetation.

Ecosystem management would emphasize biodiversity, ecosystem processes, water quality, soil productivity, and wildlife habitats and place

less emphasis on livestock production. Ecosystem health and biodiversity would improve in the long term.

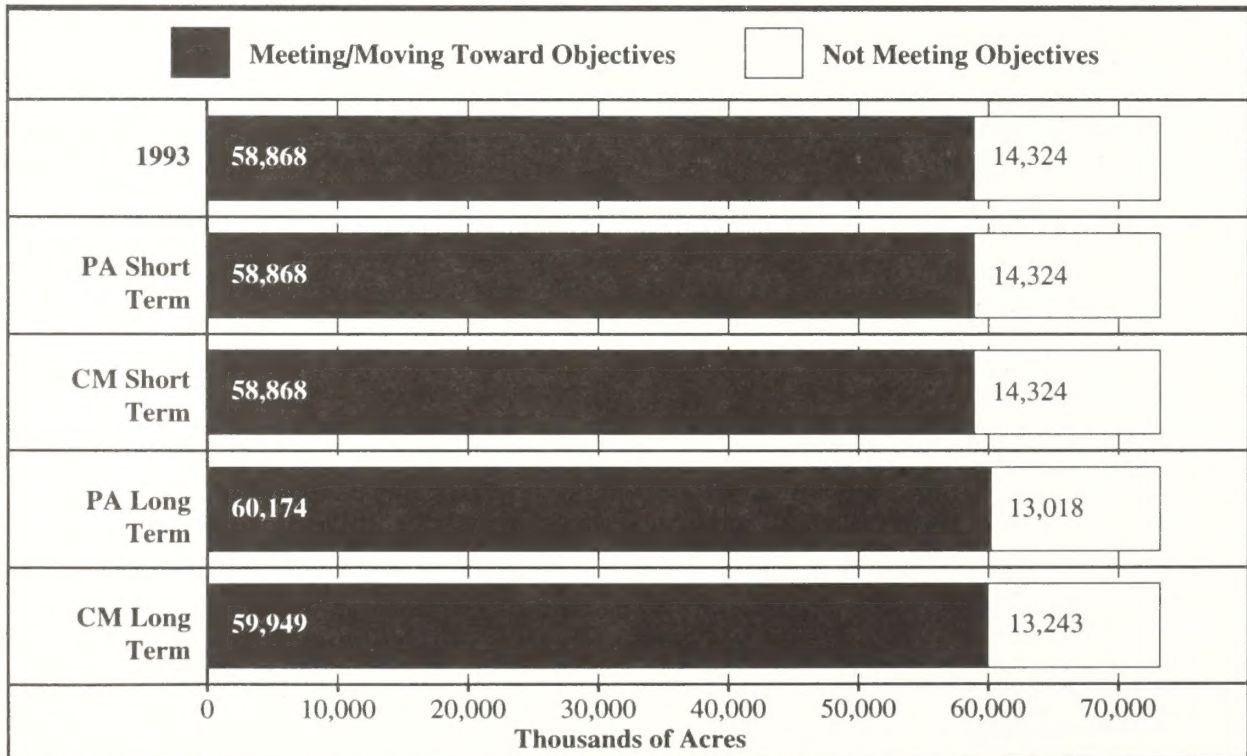
Making the Forest Service's penalties for willful and repeated willful unauthorized use consistent with BLM policy would help deter unauthorized use, reducing damage to upland and other vegetation. This impact, while locally significant, would have minor effects nationally.

By allowing appealed rangeland decisions to be implemented with fewer delays, the Proposed Action in the short term would benefit the resources involved in the decision. The Proposed Action would prevent upland vegetation ecosystems from crossing in the short term into a lower successional stage that would be difficult or even impossible to reverse.

### Upland

In the long term, about 60,174,000 acres (82 percent) of Forest Service uplands would either be meeting objectives or moving towards objectives (an increase of 2 percent from 1993). Another 13,018,000 acres (18 percent) would not be meeting objectives (a decrease of 9 percent from 1993). (See Figure 4-7.)

**Figure 4-7: Change in Status - Forest Service Uplands, Proposed Action**







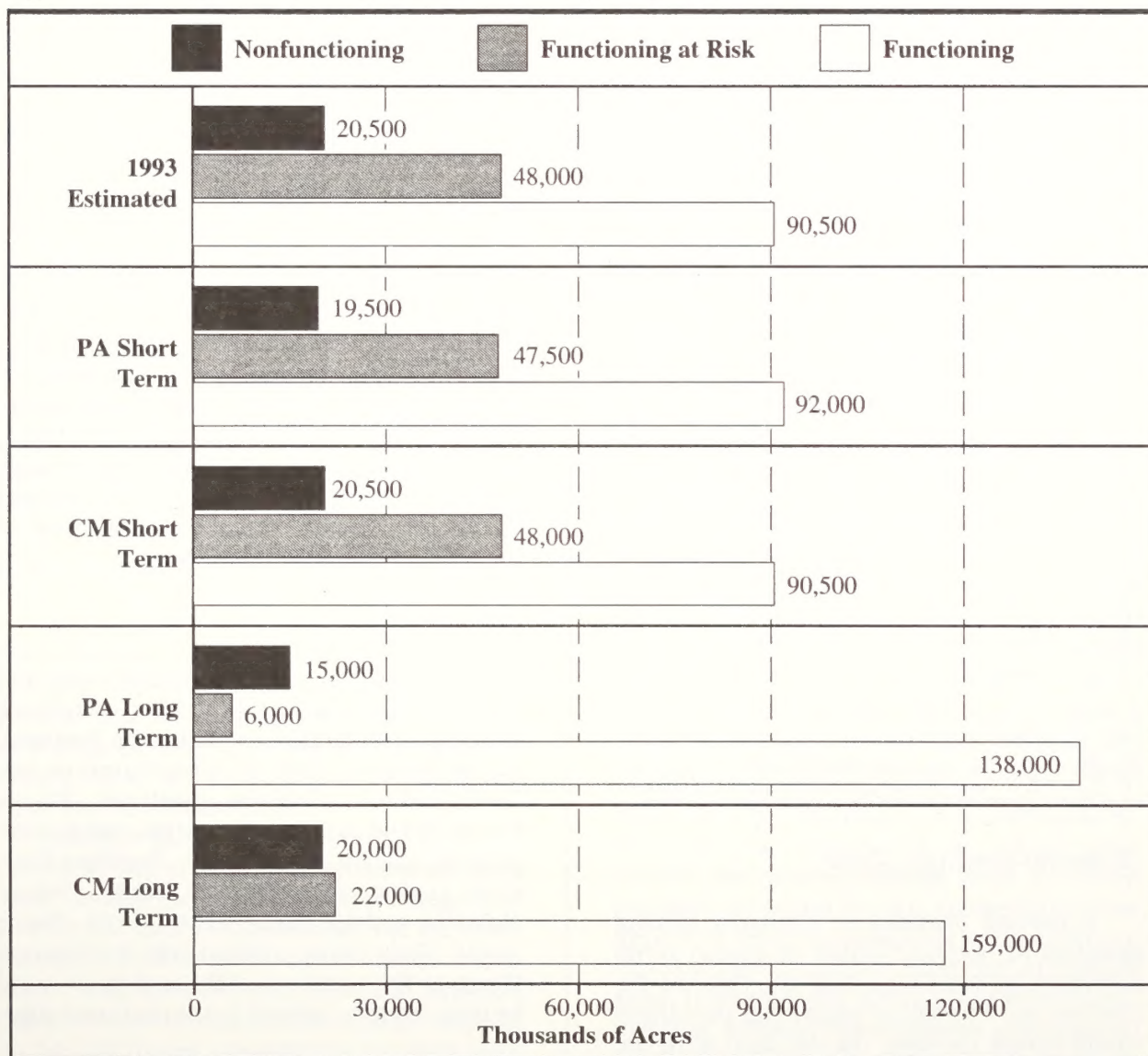
### Sagebrush

In the short term, BLM upland acres in proper functioning condition would slightly increase, upland acres functioning but susceptible to degradation would slightly decrease, and upland acres in nonfunctioning condition would decrease by about 5 percent.

In the long term, BLM upland acres in proper functioning condition would be about 138,000,000 acres (87 percent) (an increase of 55 percent from 1993), upland acres functioning but susceptible to degradation would be about 6,000,000 acres (4 percent) (a decrease of almost 90 percent), and upland acres in nonfunctioning condition would be about 15,000,000 acres (9 percent) (a decrease of 30 percent). Figure 4-8 shows estimated changes to upland functioning condition.

Implementing standards and guidelines would improve properly functioning condition, ecological condition, and trend in sagebrush communities. In the long term, perennial grasses and forbs would increase faster in areas that have 12 or more inches of annual precipitation. The amount of palatable browse would slightly increase under the ecosystem approach to management and standards and guidelines. Ecological status and trend would change as under Current Management but would change faster in areas having 12 inches or more annual precipitation. Sagebrush areas having 10 inches or less annual precipitation would not significantly improve except for the nonfunctioning

**Figure 4-8:** Change in Functioning Condition - BLM Uplands, Proposed Action





areas receiving vegetation manipulation treatments. Trend in the lower precipitation areas would not significantly change over the long term.

### ***Desert Shrub***

Removing livestock and changing grazing practices, consistent with standards and guidelines for nonfunctioning desert shrub ecosystems, would result in an immediate plant response. Improved plant vigor would be the first sign of change. But recovery after misuse might be almost imperceptible after many years in nonfunctioning desert shrub habitats. Cryptobiotic crusts would fill in more of the interspaces between plants. Forbs, grasses, and shrubs would increase over time.

Changes in ecological status and trend would be slow because of low precipitation and high soil salinity. Ecological conditions and trend in functioning areas would increase faster than those in nonfunctioning areas. The Proposed Action would allow nonfunctioning areas to improve faster than they would under Current Management. Natural revegetation, however, is a long-term process that cannot be induced in areas of low precipitation and high salinity.

### ***Southwest Shrubsteppe***

Although the general trend would increase grass cover in the southwest shrubsteppe, the response would vary by site characteristics and weather patterns. Sites with harsh growing conditions would not improve much in 20 to 30 years. Undesirable shrubs would continue to dominate many sites unless these shrubs are chemically or mechanically controlled. Current Management appears to have favored the grass component of the community. The shrub component in some cases might increase over the next 20 years. Under moderate grazing, however, shrubs appear to increase independently of grazing management (Holechek and others 1989).

### ***Chaparral-Mountain Shrub***

Removing livestock or changing grazing practices in nonfunctioning mountain shrub communities would increase the vigor of the community. Density of herbaceous perennials would slowly increase. In the short term the

Proposed Action would increase the following: palatable grasses and forbs, height and density of existing grass stands, residual vegetation material carried over the winter, and litter and fine organic material at the soil surface. Over the long term, seedlings and young palatable shrub plants would increase.

### ***Pinyon-Juniper***

Removing livestock from nonfunctioning areas and changing grazing practices on areas functioning but susceptible to degradation in pinyon-juniper ecosystems would allow the grass and shrub component of the ecosystem to increase in vigor. Livestock removal would also reduce the soil disturbance of cryptobiotic crusts. The effect on the pinyon-juniper community, however, would be slight, especially where crown density is high.

### ***Mountain and Plateau Grasslands***

In the short term, the Proposed Action would result in the following vegetation increases in the mountain and plateau grasslands: palatable grasses and forbs, height and density of existing grass stands, residual vegetation material carried over the winter, and litter and fine organic material at the soil surface. These changes would be faster and greater on areas found to be nonfunctioning or not meeting forest plan objectives. In addition, native bunchgrasses would increase, and undesirable shrubs, forbs, and grasses would decrease. These changes would occur relatively rapidly because this vegetation type occurs in areas with more than 12 inches of annual precipitation.

### ***Plains Grasslands***

Implementing national requirements and regional standards and guidelines or fallback standards and guidelines under the Proposed Action would result in an upward trend in ecological status in the plains grasslands. Wheatgrasses and needlegrasses would increase in composition relative to blue grama, Sandberg bluegrass, prairie junegrass, and sedges. Where clubmoss or blue grama prevail, little change would likely occur without site disturbance. Sites near the upper end of the seral stage would be most likely to succeed to the next seral stage.



Nonriparian drainageways or wooded draws are key areas that are heavily grazed under season-long use. Although livestock would continue to heavily use these draws, reducing livestock grazing conflicts in these bottoms would benefit these areas more than the higher adjacent areas that have traditionally been more lightly grazed. Management to improve the functioning condition of wooded draws would result in an upward trend.

### *Annual Grasslands*

Intermittent or rotational grazing used in implementing standards and guidelines would favor grasses and reduce the invasion of undesirable species in annual grasslands. Annually adjusting the number of livestock on the range would allow the vigor of native species to improve during periodic climate variations. In the short term, the Proposed Action would result in the following increases: palatable species of annual grasses and forbs, residual vegetation material carried over the winter, and litter and fine organic material at the soil surface.

### *Alpine Grasslands*

Implementing national requirements and regional standards and guidelines or fallback standards and guidelines would increase vegetation vigor in nonfunctioning areas of alpine grasslands and also improve vegetation trend. Nonfunctioning areas would slowly recover under cold temperatures and short growing seasons.

### *Coniferous and Deciduous Forests*

Under the Proposed Action, native plants in the coniferous and deciduous forest types would increase. As multi-interest involvement increases, improved grazing management would be combined with improved fire management, leading to an eventual increase in young-age classes in deciduous stands.

Palatable plants would increase in abundance, density, and vigor, especially understory forbs, grasses such as fescues and bluegrasses, and shrubs such as bitterbrush and currants. Changes would be most evident in open stands of pine and less noticeable in fir and redwood types. Overall changes would strongly depend on fire and timber management. In many coni-

fer stands the intensity of grazing has little effect on understory vegetation.

## **Riparian/Wetland/Aquatic**

In the long term, implementing national requirements and regional standards and guidelines or fallback standards and guidelines under the Proposed Action would lead to improvements in riparian conditions that support special status species, maintain water quality, contribute to watershed function, and improve an area's ecological conditions. The height, width, and amount of vegetation would become more diverse. The canopy would become more closed. Streambanks would become more stable. And native riparian vegetation communities would become reestablished.

Expanding opportunities for public participation would result in a diversity of interests being represented in resource management. Livestock production would remain a priority, but maintaining riparian and other ecological values would be recognized as a foundation of continuing long-term renewable resource management.

In the long term, 1,831,717 acres (about 84 percent) of Forest Service riparian areas would either be meeting objectives or moving towards objectives (an increase of 7 percent from 1993). Another 359,541 acres (16 percent) would not be meeting objectives (a decrease of 26 percent from 1993).

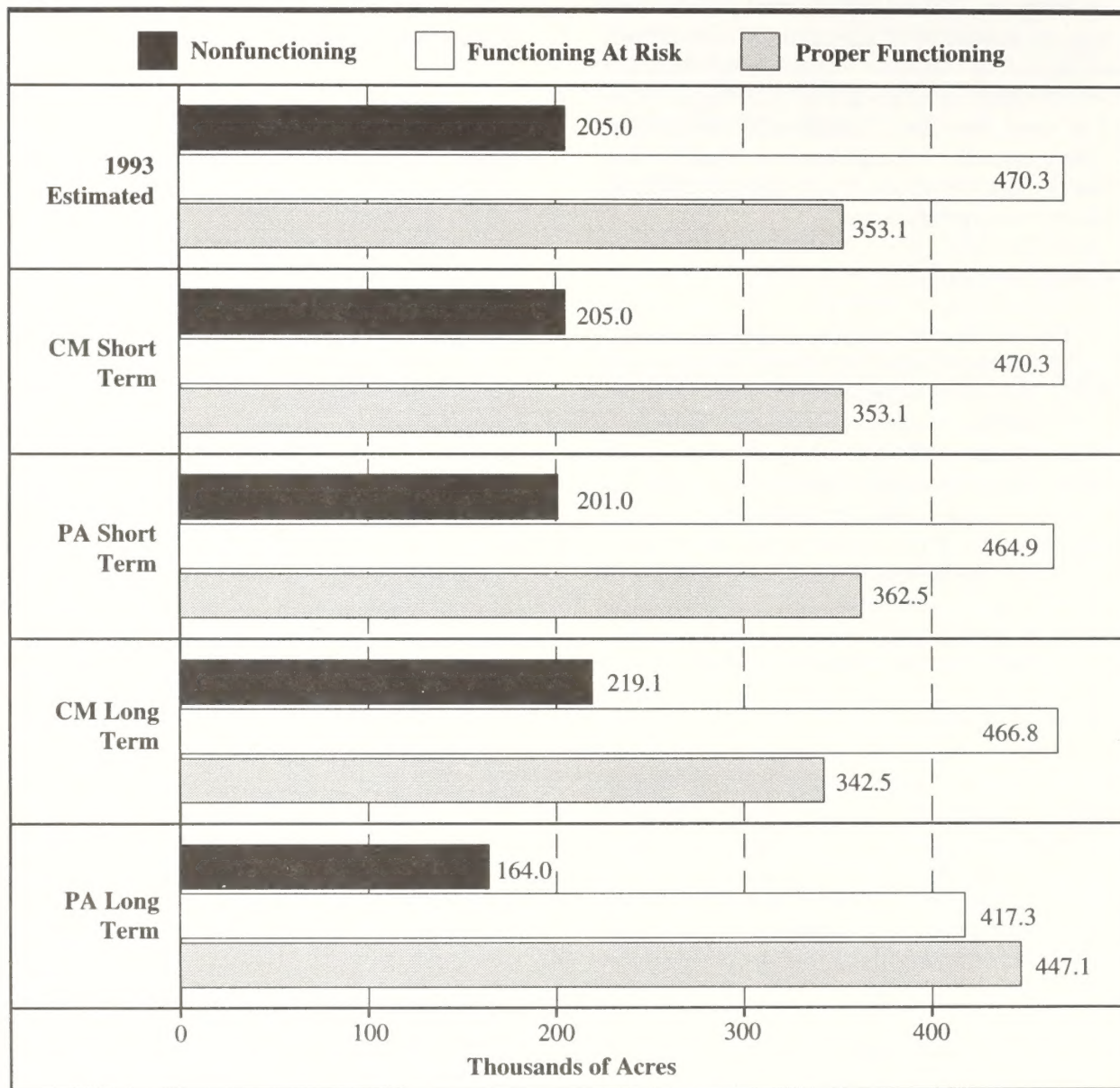
In the long term under the Proposed Action, 447,100 acres (about 43 percent) of BLM riparian areas would be properly functioning (an increase of 27 percent from 1993). Another 417,300 acres (41 percent) would become functioning but susceptible to degradation (a decrease of 11 percent from 1993). And 164,000 acres (16 percent) would be nonfunctioning (a decrease of 20 percent from 1993).

Figure 4-9 shows how the Proposed Action would change the functioning condition of BLM-administered riparian areas. Figure 4-10 shows how well the Proposed Action would allow forest plan objectives to be met on Forest Service-administered riparian areas. Improved management would result in an overall positive trend and steady improvement in the functioning condition of roughly 20 percent of riparian areas. Improvements would result from implementing national requirements and regional standards and guidelines or fallback standards





**Figure 4-9: Changes in Functioning Condition - BLM Riparian, Proposed Action**



4-46

and guidelines and ecosystem management, modifying livestock management practices, and allowing more public involvement in rangeland management.

Improvements would not be dramatic in the short term, but the Proposed Action would result in significant long-term improvements and benefits to many other resources associated with high-quality riparian areas. Grazing changes would result in large-scale, long-term improvement in riparian resources and aquatic habitat.

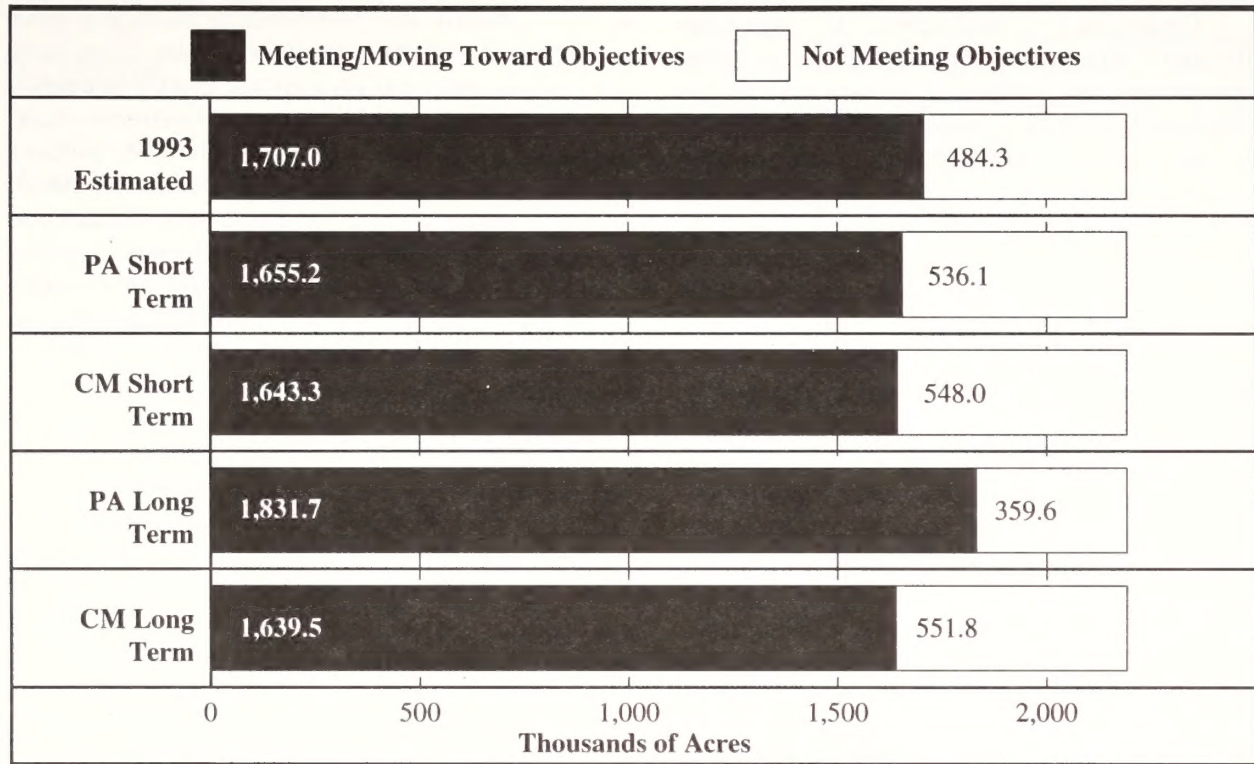
Residual standing plant material in mountain meadows would rapidly increase, especially

near perennial streams, seeps, and where the water table is within 3 feet of the soil surface. Increased plant material would mainly consist of grasses and sedges with some forbs. Fine organic litter on the soil between standing vegetation would also increase as would willow seedling establishment within the short term of implementation. In the long term, the density of willows would substantially increase, as would the vertical and horizontal closure of willow crowns, especially within about 4 feet of the ground.





**Figure 4-10: Change in Status - Forest Service Riparian, Proposed Action**



## Watershed

### Upland

Figures 4-7 and 4-8 show that the Proposed Action would little change upland watershed condition in the short term because of the time needed to fully implement this alternative and the naturally slow rate of upland vegetation change. As under Current Management, climatic variation would be the dominant short-term factor in effecting change.

Fully implemented in the long term, the Proposed Action would significantly improve upland watershed conditions. Reductions in forage consumed by livestock and changes in management would increase vegetation and litter cover and improve the physical properties of the soil, resulting in less runoff and erosion. Upland gullies would improve over the long term as they slowly revegetate and in some cases silt in and return to swalelike conditions.

Improved upland watershed condition would result from implementing national requirements and regional standards and guide-

lines or fallback standards and guidelines on BLM-administered lands and requiring that standards and guidelines in Forest Service land use plans be incorporated into grazing permit conditions. Changes in regulations would allow Range Betterment Funds to be used for repairing existing watershed projects that have exceeded their useful life expectancy and are either in danger of failing or have failed. Other provisions of the Proposed Action that would improve upland watershed condition are allowing extended periods of nonuse to meet resource objectives, altering the decision appeals process, and changing the structure of grazing advisory boards.

The vegetation communities that would best respond to the Proposed Action are the coniferous-deciduous forests, chaparral-mountain shrub, mountain and plateau grasslands, plains grasslands, and sagebrush communities where annual precipitation exceeds 12 inches.

The desert shrub, pinyon-juniper, and sagebrush communities with less than 10 inches of annual precipitation would respond much slower to management actions implemented under rangeland reform.



## Riparian/Wetland/Aquatic

Under the Proposed Action, the overall hydrologic function of riparian-stream systems would improve. Riparian-stream systems in nonfunctioning or functioning but susceptible to degradation conditions would improve towards a functioning condition over the long term. (See Figures 4-9 and 4-10.) Unstable stream channels in low sediment yield or highly fluctuating flow environments would move more slowly toward a functioning condition.

Improved riparian-stream systems would mostly result from BLM's implementing national requirements and regional standards and guidelines or fallback standards and guidelines and Forest Service standards and guidelines becoming grazing permit conditions. Other provisions of the Proposed Action that would help improve riparian conditions include allowing extended nonuse, ending the automatic staying of appealed decisions, replacing grazing advisory boards with multiple resource advisory councils, and targeting Range Betterment Funds toward areas in nonfunctioning condition. The reduction in livestock grazing that would result from implementing the above provisions and setting land management objectives to achieve desired vegetation communities would improve watershed conditions (vegetation and ground cover). Riparian-stream systems would become more stable from the reduced accelerated runoff and sediment yields resulting from upland stability.

Riparian-stream systems would also benefit from reduced livestock use. Sediment yields would decline with the decline in the trampling of streambanks and riparian areas. Reducing the physical effects of grazing would also restore stability to presently unstable channels. These improvements would partly result from improved conditions of riparian tree and shrub communities. Hydrologic functions (overbank flooding, water quality maintenance, flood peak reduction, groundwater recharge, maintenance of low flow) would progressively be restored to nonfunctioning areas.

Changes in the BLM's water regulations and policy under the Proposed Action would make BLM and Forest Service regulations and policies more consistent. Since the change is prospective, the proposed action would not affect permittees' rights or interest in water under state law. In situations where a permittee has and

continues to meet the requirements for water base property their status would be unaffected.

Overall, nonpoint-source pollution from livestock grazing would decrease from both upland and riparian sources, mostly as a result of BLM's implementing national requirements and regional standards and guidelines or fallback standards and guidelines and the Forest Service's incorporating local standards and guidelines into grazing permit conditions. Other provisions of the Proposed Action that would help reduce nonpoint-source pollution include allowing extended nonuse, ending the automatic staying of appealed decisions, replacing grazing advisory boards with multiple resource advisory councils, and targeting Range Betterment Funds toward areas in nonfunctioning condition.

Over the long term, reduced grazing resulting from the above actions and the implementing of land management objectives based on achieving a desired vegetation community would reduce sediment and salinity yields from both uplands and riparian areas. Other pollutants such as fecal coliform and nutrient enrichment would also be reduced.

Nonpoint-source salinity in the Colorado River basin, being predominantly associated with runoff and sediment yields from arid-desert shrub communities, would also decline but at a slower rate because this vegetation type responds slowly to management. Over the short term, implementing the standards and guidelines of the Proposed Action would improve water quality in local riparian and aquatic ecosystems where livestock grazing is the main economic use. Implementing full force and effect decisions would help prevent the further degrading of upland watersheds and riparian-aquatic habitats threatened by livestock grazing. Range Betterment Funds would be used to help rehabilitate threatened or nonfunctioning water-based ecosystems.

Over the long term, implementing the standards and guidelines would maintain water quality and the properly functioning condition of upland watersheds, whose main economic use is livestock grazing. Federal land managers would make better grazing decisions by using multiple resource advisory councils and implementing decisions based on ecosystem management principles.

Within local ecosystems shared by livestock grazing and other economic uses, the Proposed Action would not affect the environment in the



short or long term unless the other economic uses are involved throughout the decisionmaking process.

## Wildlife

The following provisions of the Proposed Action would all help improve wildlife habitat:

- Implementing national requirements and regional standards and guidelines or fallback standards and guidelines.
- Modifying grazing program policies and regulations.
- Changing the decision appeals process.
- Allowing nonuse to extend beyond 1 year for resource protection.
- Increasing the amount and expanding the uses of Range Betterment Funds.
- Establishing multiple resource advisory councils.
- Increasing management emphasis on ecosystem sustainability.
- Expanding regulatory authority for prohibited acts.

Administrative and managerial changes geared toward better control of livestock distribution and ecosystem sustainability would moderately improve riparian resource condition overall in the long term. But some nonfunctioning riparian areas are degraded to the point that they would no longer recover without physical treatment.

Implementing national requirements and regional standards and guidelines or fallback standards and guidelines under the Proposed Action would benefit ecological conditions in the short and long term. Emphasizing the principles of ecosystem management and improving biological diversity, these standards and guidelines would encourage BLM to rapidly recognize and resolve threatening conditions, benefiting wildlife indirectly through increased diversity in vegetation and improved habitat condition. Eventually regional standards and guidelines would further ensure that site-specific

needs are met in achieving upward trends in condition. By using livestock grazing as a management tool to maintain sustainable ecosystems, biological diversity, and vegetation productivity of proper functioning upland and riparian communities, the Proposed Action would indirectly improve wildlife resources. Any improvement of vegetation communities, particularly riparian communities, that increases structural and species diversity would indirectly benefit fish and wildlife.

The Proposed Action would expand prohibited acts to other federal and state laws, including violating water quality standards for protecting anadromous fish. Anadromous fish are now considered a "beneficial use" under state laws for water quality standards in the Northwest, and more states now have laws covering nonpoint sources of pollution. Over the long term, this change could significantly benefit aquatic habitat where, in the past, conditions of grazing permits did not include compliance with water quality laws.

Changing regulations on the approval of nonuse (including conservation use) would improve riparian and upland vegetation, which would improve wildlife habitat in the short and long term.

BLM ownership of future range improvements would allow projects to be more easily built and modified for wildlife use.

The Proposed Action would change Forest Service and BLM regulations and policies to expand and clarify the use of Range Betterment Funds for improving rangeland ecosystems instead of for just promoting livestock interests. Funds would be used for project planning, environmental analysis, and for BLM, monitoring the effectiveness of improvements. Using Range Betterment Funds to meet ecosystem management objectives would help improve riparian resource conditions and reverse downward trends in overall condition.

Waterfowl, upland game, raptors, big game, nongame species, and especially fisheries would benefit from using these funds. An example would be using funds to exclude livestock from riparian areas to allow willows or cottonwoods to regrow to improve vegetation diversity and structure. These changes would allow a more efficient and diversified use of funding than at present.

Expanding opportunities for the public to participate would increase overall support for



achieving ecologically sound resource objectives and would result in implementing decisions benefitting multiple uses. Wildlife would benefit from healthier, more diverse ecosystems.

Timely implementing of decisions for correcting environmental problems would reduce resource damage, benefitting riparian areas in the short term. These short-term benefits would allow conditions to improve sooner than they otherwise would. For example, implementing a decision before its appeal is resolved could moderately improve waterfowl habitat condition in the short term by increasing herbaceous forage and cover.

The multiple resource advisory councils would offer a balanced forum for generating multiple resource recommendations for BLM land managers. Such a forum would increase overall support for achieving ecologically sound resource objectives. The councils would also allow multiple use decisions to be implemented faster than they otherwise would. With more emphasis on ecosystems and ecosystem processes, vegetation communities would improve in structure, diversity, and function. Such improvements in riparian and upland areas would benefit habitats by providing more diverse, healthy ecosystems in which wildlife could more easily meet life requirements.

By managing rangeland to restore and maintain natural ecosystems, the Proposed Action would benefit wildlife in the long term by increasing or improving the amount and quality of habitat. With restored naturally functioning ecosystems comes an increase in biological diversity. Greater biological diversity would allow more opportunities for most species to meet basic life requirements. The Proposed Action would decrease the loss of plant species composition, encroachment of unpalatable plants, loss of plant vigor and soil structure, damage to residual plant cover from hoof action and trampling, and depletion of surface water through defoliation of watersheds. All of these changes would benefit most wildlife species. The biodiversity of associated riparian and aquatic communities would steadily increase over the long term.

Species that benefit from degraded range conditions (reidsided shiner, grasshopper, cowbird, black-tailed jackrabbit) would be harmed by conditions benefitting more desirable species (Lahontan cutthroat trout, southwestern willow flycatcher, cottontail rabbit).

Under the Proposed Action, range improvements, including water development for livestock grazing on public lands, would continue to be used, built, and maintained. As ecosystem management is implemented, a broader view of range improvement impacts would be assessed on an ecosystemwide basis to reduce or mitigate subtle changes in overall ecosystem function.

The only significant exception to this general overview of riparian resources across the West could occur in the Coastal and Columbia Basin analysis areas where the possible implementation of some provisions of PACFISH (which is presently under development) might significantly change recreational use, grazing practices, and timber harvesting to comply with the Endangered Species Act. If some of these provisions are adopted and implemented, riparian habitat improvement rates within PACFISH areas could far exceed those in other areas where PACFISH recommendations would not be applied.

## Big Game

Upland vegetation types removed from grazing in nonfunctioning uplands would move more rapidly toward the potential natural community. General vegetation changes would favor species associated with upper seral stages. For example, in areas occupied by elk and mule deer, elk would be favored where vegetation moves toward a higher percent composition of grasses. Big game populations would then move toward stability in the long term but occupy different proportions of habitats than they do now. Species favored by these vegetation trends would include bighorn sheep and elk. Pronghorn antelope and mule deer habitat conditions would generally decline due to a shift from brushy to herbaceous vegetation. Habitat diversity would be maintained on a local basis through land treatment projects and natural events such as wildfire, drought, and disease.

Riparian conditions would improve overall, moving moderately toward proper functioning condition. (See Figures 4-9 and 4-10.) Increases in woody vegetation in most riparian community types would improve the quality of big game habitat by increasing the structural diversity of these areas and providing higher quality hiding and thermal cover. The movement of riparian vegetation types toward the potential



natural community would also increase forage and improve forage quality for big game. Succulent forage in meadows (wetlands) would grow later into the dry season, providing better quality forage for a longer time.

## Upland Game and Nongame

In the long term the Proposed Action would benefit upland and nongame in riparian areas by increasing the diversity of vegetation structure and species, the availability of surface water, and availability and duration of succulent vegetation. In some cases, improvements in riparian and upland vegetation structural components would slow or halt declines in local upland and nongame populations. The long-term response of these species, however, would be moderated by habitat loss or fragmentation by means other than grazing.

The long-term effects of the Proposed Action would be more significant in areas with larger blocks of public lands, low human population densities, and high proportions of grazing. Upland increases in vegetation species composition and structural diversity could significantly increase upland and nongame populations, especially in areas of higher precipitation where the progression toward potential natural communities would be more rapid. (See Figures 4-7 and 4-8.) But the response of these populations could be moderated by other factors, such as fire or its absence, encroachment of exotic plants, intensive recreation use, or conversion of nearby private lands to farming.

## Waterfowl

Improvements in riparian and aquatic functioning condition would correlate directly to modest long-term improvement of waterfowl habitat. The removal of sediment from water would encourage aquatic macroinvertebrate production and plant growth, meaning more food for waterfowl. Proper livestock management and less grazing pressure on riparian-wetlands would improve waterfowl nesting and cover habitat.

Implementing national requirements and regional standards and guidelines or fallback standards and guidelines would benefit ecological conditions in the short and long term. Emphasizing the principles of ecosystem management and biological diversity, these standards

and guidelines would allow threatening conditions to be rapidly recognized and resolved, immediately improving waterfowl habitat. Improved ecological condition of waterfowl habitat would include reductions in sedimentation from waterways, which would encourage aquatic plant growth and more food for waterfowl.

Proper livestock management and less grazing pressure on wet meadows would improve waterfowl nesting and cover habitat. Increased plant species composition, plant vigor, residual plant cover, and properly functioning watersheds would improve habitat for nesting, brood rearing, and migration.

## Raptors

Improvements in upland and riparian vegetation communities and the overall broader focus on managing rangeland resources for improved ecological health and conditions would mean improved nesting habitat and increased prey populations for raptors in general. Long-term riparian habitat changes would see the expanding or re-establishing of large woody species, such as cottonwood and aspen. These conditions would result in better nesting, hunting, and hiding conditions for riparian-dependent raptors.

## Resident and Anadromous Fish

As livestock are removed or their season of grazing use is changed, riparian vegetation would quickly improve in the short term, leading to the steady long-term improvement of riparian condition and fishery habitats. This improvement would result from increased overhanging banks and stream cover, lowered water temperatures, increased instream structural diversity, improved water quality, increased macroinvertebrate production, and moderated streamflows.

## Special Status Species

The Proposed Action would result in vegetation characteristics that trend toward potential natural communities, which are favored by most special status species. Special status species trends would mirror the change rates predicted for upland vegetation under the Proposed



Action. (See Figures 4-7 and 4-8.) The following are some examples of changes under the Proposed Action that might affect special status species.

- The western sage grouse in the sagebrush vegetation type would increase with expected patchy increases in herbaceous perennials and a more diverse plant community leading to greater resilience to natural disturbances.
- The ferruginous hawk is another species that would not benefit from extensive increases in herbaceous cover in the sagebrush or plains grasslands vegetation types. More cover would somewhat conceal this hawk's prey, which often consists of ground squirrels or rabbits. Grazing management that maintains or creates patchiness would benefit this bird.
- The historical relationship of bison, prairie dogs, and black-footed ferrets could be enhanced where cattle take the place of missing bison. Heavily grazing in patches, bison produced open areas suitable for prairie dogs. Networks of large, dense prairie dog colonies, are most suitable for black-footed ferrets.

As state water quality standards are met, most aquatic special status species would recover. Change rates would follow those predicted for the associated riparian-wetland communities over the long term.

For example, increased microhabitat diversity would result in increasing populations of Lahontan cutthroat trout (and other cutthroat trout subspecies), woundfin, Gila trout, Colorado roundtail chub, Gila topminnow, Pecos gambusia, Hygrotus narrow-footed diving beetles, and others. Several species such as Colorado squawfish, razorback sucker, and bonytail chub would experience little effect because factors other than changes in vegetation would mask or overwhelm their response to grazing management.

Increased upland cover and riparian vegetation would lead to less siltation of ponds and other impoundments. As a result, each water would have a longer effective life, extending productivity over time for prey items used by

special status species. At springs and seeps, special status species like many spring snails would increase in numbers following associated riparian growth, decreased siltation, and bankside stabilization.

The following provisions of the Proposed Action would affect special status species just they would for general wildlife:

- prohibited acts
- range improvement ownership
- Range Betterment Fund use
- full force and effect
- grazing advisory boards
- rangeland ecosystems

More nonuse would result in short to mid term, slight increases in forage and cover access on limited areas, promoting habitat characteristics required by some upland, riparian, and aquatic species. For example, the Arizona hedgehog cactus in the chaparral-mountain shrub vegetation type, as well as the Sacramento prickly poppy and Kuenzler hedgehog cactus in the pinyon-juniper type, could experience a short-term decrease in damage due to inadvertent trampling and a slight increase in recruitment during nonuse periods. Additionally, nonuse in times of drought could benefit the desert tortoise through increased access to severely limited forage.

BLM state directors would have the flexibility to distribute the Secretary of the Interior's half of Range Betterment Funds within their states. Such flexibility would allow for sending funds to places most in need of improvement. Habitat characteristics in uplands and riparian/wetlands would improve in the long term where conflicts require on-the-ground treatments to alleviate special status species impacts or promote restoration and recovery. For example, fencing to protect plants or establish riparian pastures would enable management to meet standards and guidelines in riparian areas, improving habitat characteristics needed by spikedace, loach minnows, bald eagles, northern beardless tyrannulets, and southwestern willow flycatchers.



Synergistic effects of implementing the standards and guidelines and regulation changes would lead to a moderate long-term trend toward restoring some sensitive species and indirectly toward recovery of several listed species. Vegetation changes would result in more cover and forage. Special status plants would be less likely to be damaged by trampling, and their regeneration would likely increase. The trend would mirror predicted vegetation changes with an additive increase in cover and forage availability or access. The availability and access changes are related to the lower use of herbaceous plants. Livestock would continue to trail and compact soil in an irregular zone around present and future rangeland developments such as waters and handling facilities with rills and gullies present in some situations, except in riparian/wetland areas.

## Wild Horses and Burros

Under the Proposed Action, improved upland and riparian vegetation would result in improved habitat conditions for wild horses and burros where livestock competition has been reduced.

The Proposed Action related to water rights would, by confirming federal ownership of grazing-related water rights (when permitted by state law), ensure access to water sources for a variety of multiple uses, including wild horses and burros. Wild horses and burros would disperse over the entire herd area, reducing concentrations of grazing animals in many areas, especially in riparian zones. The overall vegetation condition of the herd area would improve over the long term. With better dispersement of horses, bands would interact normally with each other. The condition and health of wild horses could improve resulting in less stress, injury, and death.

By holding title to future permanent range improvements, BLM could enhance management of a broader diversity of values on the public rangelands, including wild horses and burros. BLM would also consider the free-roaming nature of wild horses when locating and building livestock fences and wild horse needs when developing water sources and land treatments. Under the Proposed Action wild horses would continue to use normal grazing use areas, and water sources and would be less likely to be shut away from traditional use areas.

Replacing grazing advisory boards, multiple resource advisory councils with a balanced view of local, regional, and national issues and would increase the consideration of wild horse needs in local resource management. These councils would strongly influence the type, location, and design of range improvement projects, which would benefit wild horses and burros as discussed above.

## Recreation

Increased management of livestock grazing under the Proposed Action would improve overall recreation experiences at developed and undeveloped recreation sites. The quality of recreational user experiences would improve at fenced developed sites because of improved vegetation condition, which would decrease fence-line contrasts. User experiences at unfenced developed sites, especially in riparian areas, would improve slightly in the short term and moderately in the long term. As vegetation reestablishes where it is now degraded, water quality would improve, improving fishing, boating, swimming, and wildlife viewing. Many objectionable conditions, such as the presence of livestock, fecal matter, unpleasant odors, increased insects, and streambank erosion, would be eliminated over the long term. In the drier upland areas, vegetation condition and overall naturalness would improve slightly in the long term. Undeveloped recreation sites would improve for the same reasons as developed sites.

Scenic quality would slightly improve in areas now heavily used by livestock, such as around water developments, in riparian areas, and near salting areas and sheep bedding grounds. In the long term, riparian areas would moderately improve as adjustments in livestock numbers, season of use, and grazing systems allow the recovery of natural vegetation. Upland scenic quality would improve only slightly in the long term.

Commercial permit holders, such as outfitters and guides, would benefit from improvements in vegetation condition, water quality, and wildlife habitat, especially in riparian areas. This improvement would make commercial services more marketable. Existing and new range improvement projects, especially fences, would continue to constrain motorized and nonmotorized events.



## Wilderness

Under the Proposed Action, the increased management of livestock in wilderness and wilderness study areas (WSAs) recommended for designation would result in long-term improved vegetation condition and water quality (especially in riparian areas) and less degrading of naturalness. Erosion damage would also decline. Better vegetation conditions would allow fewer opportunities for undesirable plants to become established. On the other hand, livestock and range improvement projects would continue to lessen opportunities for solitude and primitive and unconfined recreation.

## Cultural and Paleontological Resources

National requirements and regional standards and guidelines or fallback standards and guidelines under the Proposed Action would recognize the importance of cultural resources and allow cultural resource management decisions to be more consistently implemented. These decisions would be used to develop permit conditions. The Forest Service would also require that forest plan standards and guidelines for grazing be made part of the conditions of the grazing permit and that annual grazing use and permit renewal depend on the permittee's adherence to these conditions. The requirement that new livestock management and holding facilities be located outside riparian-wetland areas would generally benefit cultural resources since these areas have a higher density of cultural resources.

The Proposed Action would revise BLM livestock grazing regulations to allow grazing permits to be canceled for violations of the Archaeological Resources Protection Act of 1979 (16 U.S.C. 470aa et seq.) and the Native American Graves Protection and Repatriation Act (25 U.S.C. 3001).

The Proposed Action would also eliminate BLM district grazing advisory boards and advisory councils and replace them with multiple resource advisory councils. In addition to commodity interests, the boards would represent a variety of interests, including environmental groups (historic preservationists) and tribal councils.

The Proposed Action would destroy fewer cultural resources than would Current Management because the Section 106 process would be supplemented by cultural resource management within the rangeland management program.

## Economic Conditions

Cumulative impacts under the Proposed Action would be similar to those under Current Management in the long term. In the short term, however, greater forage reductions under the Proposed Action would have a slightly greater cumulative impact than under Current Management.

The impacts under the Proposed Action would result from a wide variety of trends now affecting agriculture in general and livestock production in particular. (These trends are discussed in Chapter 3.) In addition, in the future a variety of emerging issues might accelerate or offset ongoing trends in agriculture.

Population growth in the West and in many western rural communities will continue to transform rural economies. Population growth in many rural communities, while contributing to economic growth and diversification, will continue to diminish the relative importance of agriculture in those communities. But economic diversification also offers more opportunities to earn off-ranch income and thus to help families maintain their ranches. Communities that continue to lose population and whose economies are in decline may be further strained by decreases in livestock production.

Land use changes, such as increased recreation use and subdivision of privately owned ranch lands, are both a cause and a result of trends in agriculture. Economically marginal ranches may be encouraged to sell to developers in regions where demand for rural homesites is increasing, resulting in further decline in agricultural production. Increased outfitter and guide activities, which encourage more recreational use of rural areas and offer more income-earning potential to ranchers, may contribute to population growth and in turn accelerate changes in land use away from agricultural production.

Land use changes could affect community tax bases. The impact to a local economy of a change in livestock production depends on the



relative size and growth trends in other sectors of that economy. Where a relatively significant livestock industry declines, tax revenues have a high probability of declining. On the other hand, where other sectors of the economy are stable or growing and a relatively small decline occurs within a large livestock industry (or a large decline occurs within a small livestock industry), major impacts to the tax base are unlikely.

Changes in land use may accelerate the decline in public access to public lands where access depends on crossing private lands. Reduced access may increase the demand for land adjustment (such as land exchanges or easement acquisition) by BLM and the Forest Service to obtain more access to public lands.

Policies aimed at recovery of endangered species, such as desert tortoises, anadromous fish, and grey wolves, would continue to affect livestock production by restricting livestock grazing in endangered species habitat. On the other hand, future activities designed to avert habitat loss and endangered species listings may help sustain livestock production in the long term.

Eliminating the Federal Government's wool subsidy program over the next 3 years could accelerate the decline in sheep production in the West and may cause marginal sheep producers to sell their operations. Other government policies, such as trade agreements aimed at reducing international trade barriers, will also continue to affect the industry. Agreements of this kind may both increase and decrease livestock production, but the direction and magnitude of these impacts is beyond the scope of this EIS. The expiration of Conservation Reserve Program (CRP) contracts beginning in 1996 might encourage the use of croplands for pasture, thereby increasing forage for livestock.

The most important direct and indirect economic effects that would result from implementing the Proposed Action are discussed in the following sections.

## Regional Economic Impacts

Effects on employment and income would stem from two sources: reduced forage that would be used for livestock grazing and increased grazing fees for the remaining forage that

livestock can graze. Appendix N, MicroIMPLAN System and Methodology for Estimating Impacts to Employment and Income, describes the methodology used to assess the economic impacts.

Under the Proposed Action, forage grazed by livestock on BLM- and Forest Service-administered lands is projected to decline by 12 percent after 5 years and by 21 percent after 20 years. For Current Management, available forage will decline by 5 percent in 5 years and 20 percent in 20 years (18 percent for BLM and 19 percent for the Forest Service). These projections are based on trends over the past 10 years (reflected in Current Management), which are expected to continue, and management actions under the Proposed Action, which are expected to reduce forage grazed in the short term. In comparison to Current Management, the Proposed Action has 7 percent fewer AUMs available in the short term (5 years) and 1 percent fewer in the long term (20 years). The Proposed Action would result in a greater short-term decline in forage consumed by livestock than would Current Management (12 percent versus 5 percent), but in the long term forage reductions under the two alternatives would be virtually the same.

Although in the short term, employment and income would decline more under the Proposed Action than under Current Management, long-term declines under these two alternatives would be similar. Impacts would be minor in comparison to current conditions and trends in the westwide economy as a whole and in the agriculture sector in particular. The impacts would occur in the context of an economy that has shown consistent growth over the past 10 years and is expected to continue growing. Thus, continued growth in employment and income in other sectors would tend to overshadow the relatively small employment and income reductions from implementing the Proposed Action.

After 5 years, employment is estimated to decline by a range of 1,680 to 2,710 job (about 0.1 percent of the total westwide agricultural employment under the current PRIA fee alternative 1, and 0.2 percent under the regional fees and competitive bidding fee alternatives 4 and 7, respectively). (Under current management there would be a comparable decline of between 710 and 1,822 jobs.) (See Table 4-4.) Under the BLM-Forest Service proposed fee formula (fee alternative 3), the decline is estimated to be be-





**Table 4-4: Decreases in Employment and Income 5 and 20 Years after Implementing Proposed Action**

	Fee Level						
	PRIA (Current)	Modified PRIA	BLM/FS Proposed	Regional	FFF	PRIA with Surcharge	Competitive Bidding
Decreased Employment							
After 5 Years	1,682	2,047	2,167	2,712	1,777	2,053	2,712
After 20 Years	2,706	3,088	3,195	3,684	2,845	3,093	3,684
Decreased Income (1993 \$)							
After 5 Years (\$000)	\$ 67,906	\$ 81,427	\$ 85,870	\$106,085	\$ 71,422	\$ 81,653	\$106,085
After 20 Years (\$000)	\$111,472	\$124,610	\$127,599	\$145,746	\$114,628	\$123,813	\$145,746

tween 2,053 jobs to 2,170 jobs, or 0.1 percent<sup>3</sup>.

After 20 years, employment is estimated to decline by a range of 2,760 jobs (PRIA fee) to 3,684 jobs (regional fees and competitive bidding) under the Proposed Action, as compared with an estimated decline of 2,643 to 3,579 jobs under current management. Under the BLM-Forest Service proposed fee formula, the decline is estimated to be between 3,093 and 3,295 jobs as compared with a 3,084 job decline if the proposed fee formula is applied to the Current Management Alternative. The 20-year declines across all fee levels are estimated to be about 0.2 percent of total agricultural employment westwide.

Total income after 5 years is estimated to decline by a range of \$67.9 to \$106.1 million under the Proposed Action compared with \$28.7 to \$69.9 million under Current Management. (Under the current PRIA fee this would be about 0.2 percent of total agricultural income westwide; under regional fees and competitive bidding, about 0.3 percent.) Under the BLM-Forest Service proposed fee formula, the decline is estimated to be between \$81.7 million and \$85.9 million (about 0.3 percent) under the Proposed Action versus \$48.0 million under Current Management. (See Figure 4-10a).

Total income after 20 years is estimated to decline by a range of \$111.5 to \$145.7 million under the Proposed Action compared with \$106.7 to \$141.5 under Current Management.

(Under the current PRIA fee this would be about 0.3 percent; under regional fees and competitive bidding, about 0.4 percent.) Under the BLM-Forest Service proposed fee formula, the decline is estimated to be between \$123.8 million and \$127.6 million (about 0.4 percent) under the Proposed Action as compared with \$123.1 million under Current Management. (See Figure 4-10a). (Table 2 in Appendix P, Change in Employment and Income After 5 Years and 20 Years of Implementation Under Different Fee Levels, contains more-detailed information on employment and income impacts.)

On a local level impacts could be proportionately smaller or larger, but the location and intensity of impacts cannot be easily estimated. In the Desert Southwest and Rocky Mountains and High Plains analysis areas, BLM livestock forage would decline by a less-than-average 13 percent over the long term, as opposed to 21 percent westwide. The Coastal analysis area would have a greater-than-average decline in forage consumed by livestock, but the unit's small amount of livestock grazing on federal land would make employment and income impacts insignificant.

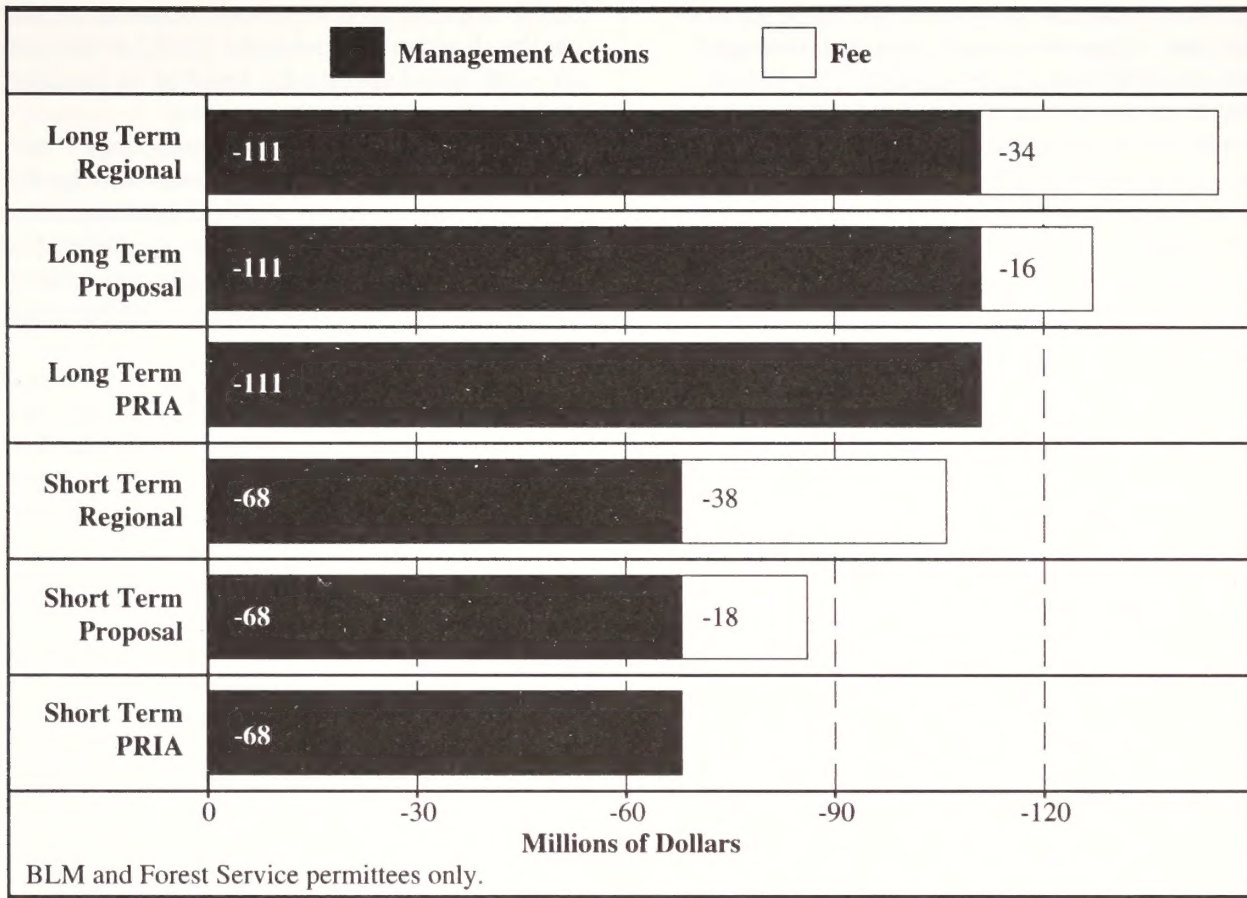
The impacts from reduced forage do not consider other factors that could mitigate overall impacts. For example, declines in employment and income from forage reductions do not consider periods for phasing in higher grazing fees (3 years or longer). Phasing in higher fees would reduce short-term impacts. Nor do these impacts account for the economy's ability to absorb gradual changes in forage available over

<sup>3</sup> The impacts for the BLM/Forest Service Proposed Fee are presented as a range between those caused by a \$4.28 fee and those caused by a \$3.72 fee. See **Assumptions and Analysis Guidelines** for more information.





**Figure 4-10a: Reductions in Income, Livestock Industry, Proposed Action**



time (i.e. 21 percent over 20 years) as opposed to a sudden 21 percent decline in 1 year.

Improvements in resource conditions under the Proposed Action would create long-term benefits that would offset employment and income declines. Improved wildlife habitat and recreation sites would generate increases in employment and income as hunting, fishing, and wildlife viewing increase. These impacts would result both from changes in resource management and later improvement in range ecological health, and from increases in Range Betterment Funds from higher grazing fees.

### Ranch Income and Operation Impacts

This section describes the impacts to ranch operations and income of changes in the amount of forage allocated to livestock grazing, increases in grazing fees, and regulation changes that might affect permittee operations. Impacts are shown for three hypothetical herd sizes: 425

cows, 210 cows, and 90 cows. Impacts are also considered for two levels of federal forage dependency for each of these three operations: 60 and 30 percent. Appendix N, Changes in Ranch Returns from Reduced AUMs and Higher Grazing Fees, describes the methodology used to assess the impacts to ranch operations.

Under the Proposed Action, forage consumed by livestock would decrease 7 percent more than under current management after 5 years and 3 percent more than under current management over 20 years. The Proposed Action would result in a greater short-term decline in forage than under Current Management (12 percent versus 5 percent). But the long-term forage decreases under these alternatives would be virtually the same. These figures are a westwide average, not necessarily representing forage reductions for all ranch operations. An estimated 12 percent decline in available forage westwide does not mean that each and every permittee will experience a 12 percent decline. Instead, estimated changes in forage availability would



vary generally between regions and among permittees. Table 4-5 shows short- and long-term losses in net cash returns to the six hypothetical operations as a result of reduced forage for the current PRIA fee level (\$1.86), the BLM-Forest Service proposed formula (\$3.96)<sup>4</sup>, and the weighted average regional fee level (\$6.38).

In this analysis the impact would be greatest for a herd size of 425 cows and a 60 percent dependency on federal forage. In the short term, a 12 percent reduction in forage at the current fee level (\$1.86/animal unit month [AUM])

would decrease net cash returns (cash receipts minus cash expenses) by \$2,700. At \$4.283.96/AUM, net cash returns would decline to \$9,300 in the short term. And at \$6.38/AUM, net cash returns would decline by \$14,900 in the short term.

In the long term, a 21 percent forage reduction at the current fee level would decrease net cash returns by about \$4,800. At \$3.96/AUM, net cash returns would decline by \$10,600 in the long term. And, at \$6.38/AUM, net cash returns are estimated to decline by \$15,700 in the long term.

The operation with a herd size of 425 and 60 percent dependency on federal forage consumes 3,060 AUMs of federal forage (425 \* 12 months \* 0.6). After 5 years, the operation would be allowed 2,900 AUMs, and after 20 years

<sup>4</sup> The analysis for the BLM/Forest Service Proposal is actually based on a \$4.28 fee. \$4.28 is the value that would be produced with a FVI of 1.08. See [Assumptions and Analysis Guidelines](#) for more information.

**Table 4-5: Impacts to Ranch Operations under the Proposed Action**

Alternative 2: Proposed Action	Ranch Attributes			Herd Impacts	Net Cash Returns Lost		
	Herd Size	Percent Dependency on Federal Forage	Percent AUM Reduction	# of Cows Lost per Permitted Herd	Due to Smaller Herd Size <sup>1</sup>	At \$3.96/AUM <sup>2</sup>	At \$6.38/AUM <sup>3</sup>
Year 5	425	60.0	12.0	31.8	\$2,735	\$9,252	\$14,906
	425	30.0	12.0	15.9	1,367	4,625	7,453
	210	60.0	12.0	15.7	1,350	4,570	7,364
	210	30.0	12.0	7.9	679	2,289	3,686
	90	60.0	12.0	2.4	206	1,586	2,783
	90	30.0	12.0	1.2	103	793	1,392
Year 20	425	60.0	21.0	55.7	4,790	10,640	15,717
	425	30.0	21.0	27.8	2,391	5,316	7,854
	210	60.0	21.0	27.5	2,365	5,256	7,764
	210	30.0	21.0	13.8	1,187	2,632	3,887
	90	60.0	21.0	4.2	361	1,600	2,675
	90	30.0	21.0	2.1	181	800	1,338

<sup>1</sup> Net cash returns lost at current fee level.

<sup>2</sup> Net cash returns lost due to herd size reductions plus increased fee (to \$4.28/AUM) on remaining federal forage. This analysis for the BLM/Forest Service Proposal of \$3.96 is based on a \$4.28 fee. \$4.28 is the value that would be produced with a FVI of 1.08 instead of an FVI of 1 as proposed. See [Assumptions and Analysis Guidelines](#) for more information. The impacts presented here are overstated by 3 to 12 percent, depending on the management alternative.

<sup>3</sup> Net cash returns lost due to herd size reductions plus increased fee (to \$6.38/AUM) on remaining federal forage. \$6.38/AUM is the average value of the regional fees (weighted by the number of AUMs in each state charged at each fee level).



it would be allowed 2,450 AUMs. Although income impacts might be significant for this and other operations using a large amount of federal forage, only 8 percent of BLM permits and 4 percent of Forest Service permits allow the grazing of more than 2,000 AUMs; 75 percent of BLM permits and more than 50 percent of Forest Service permits allow 500 or fewer AUMs.

The 90-cow operation with a 60 percent federal forage dependency is most closely associated with the permit size category of 500 or fewer AUMs. This operation is assumed to have 650 AUMs ( $90 * 12 \text{ months} * 0.6$ ). The 210-cow operation with 30 percent dependency and 760 AUMs is also representative of this permit size category.

Although permittees respond to reduced forage mainly by decreasing their herd sizes, they can also respond in other ways to somewhat offset losses of federal forage. Responses may include substituting other forage, such as by leasing more private pasture; using supplemental feed, such as hay; increasing the productivity of private lands, such as by pushing ditches further up sideslopes or installing wells and center pivot sprinkler systems to increase vegetation on private property; and encouraging federal agencies and state game officials to install wildlife bait stations to keep elk and deer in the uplands to reduce competition for forage.

Reductions in federal forage would have the greatest effect on permittees who most highly depend on such forage to meet their feed requirements. Impacts of reductions would vary with the financial condition of the ranch. Unprofitable ranches would be further stressed by reductions in federal forage and increases in grazing fees. The more profitable an operation, the better it would deal with higher fees and reduced access to federal forage.

The effect of reduced federal forage and higher grazing fees would also depend on a ranch's flexibility in finding and purchasing alternative forage sources. Ranches with the fewest alternatives and least flexibility would reduce their herds the most in response to higher fees and fewer AUMs. Even ranches that do not greatly depend on federal forage would be stressed by reductions if they cannot find affordable alternative forage.

Several proposed regulation changes might also affect ranch operations. Permittees are most likely to be affected by surcharges for subleases and pasturing agreements on BLM permits, full

force and effect decisions, and conservation use. Surcharges for subleases and pasturing agreements would reduce the profitability of such practices and reduce ranch income for affected permittees. Placing decisions into full force and effect might reduce ranch income to the extent that it limits livestock production.

The impacts of reduced federal forage, higher grazing fees, and regulation changes would be somewhat lessened by phasing in an increase in grazing fees over a 3-year or longer period. Additionally, the gradual reduction in federal forage over the long term would also let permittees change their operations. Another potential mitigating measure that would lessen impacts would be an incentive fee reduction or a two-tiered grazing fee system allowing small family ranches to pay a lower fee than larger commercial operations. Increases in Range Betterment Funds resulting from higher grazing fees might also help mitigate losses to ranch operations by funding more improvements that benefit livestock.

## Grazing Fee Receipt and Payment Impacts

Table 4-6 shows the changes in grazing fee receipts under the Proposed Action. In the short term, these changes (whether decreases or increases) would be greater under the Proposed Action than under Current Management due to greater short-term forage reductions. In the long term, fee receipts under the Proposed Action and Current Management would be virtually the same.

Keeping the current PRIA fee would cause receipts to decline by 12 percent (\$3.7 million) over 5 years and by 21 percent (\$6.5 million) over 20 years.

Under all other fee levels, grazing fee receipts would increase over current conditions. The federal forage fee (alternative 5) would generate the lowest increase over time: \$3.6 million (12 percent) in 5 years, and \$77,000 (0.2 percent) in 20 years.

The regional fees (alternative 4) would generate the greatest increases: \$62.1 million (202 percent) in 5 years and \$52.6 million (171 percent) in 20 years.

The BLM-Forest Service proposed fee formula (alternative 3) would generate increases between these two extremes: \$31.5 million in 5



**Table 4-6: Proposed Action: Change in Grazing Fee Receipts (over current) after 5 Years and 20 Years under Different Fee Alternatives (Millions of 1993 \$)**

	Current	Current PRIA Fee		Modified PRIA Fee		Proposed Action Fee		Regional Fees and Competitive Bidding		Federal Forage Fee		PRIA with Surcharge	
		5 Years	20 Years	5 Years	20 Years	5 Years	20 Years	5 Years	20 Years	5 Years	20 Years	5 Years	20 Years
Range Betterment Fund (RBF)	\$15.39	\$13.54	\$12.16	\$26.87	\$24.12	\$31.16	\$27.97	\$46.45	\$41.70	\$17.19	\$15.43	\$27.08	\$24.31
BLM	\$9.47	\$8.33	\$7.48	\$16.53	\$14.84	\$19.17	\$17.21	\$28.57	\$25.65	\$10.57	\$9.49	\$16.66	\$14.96
USFS	\$5.92	\$5.21	\$4.68	\$10.34	\$9.28	\$11.99	\$10.77	\$17.88	\$16.05	\$6.62	\$5.94	\$10.43	\$9.36
Payments States/Countries	\$6.00	\$5.28	\$4.74	\$10.47	\$9.40	\$12.14	\$10.90	\$18.10	\$16.25	\$6.70	\$6.01	\$10.55	\$9.47
BLM	\$3.32	\$2.92	\$2.62	\$5.80	\$5.21	\$6.73	\$6.04	\$10.03	\$9.00	\$3.71	\$3.33	\$5.85	\$5.25
USFS	\$2.67	\$2.35	\$2.11	\$4.67	\$4.19	\$5.42	\$4.86	\$8.07	\$7.25	\$2.99	\$2.68	\$4.71	\$4.23
Receipts to Fed Treasury	\$9.39	\$8.27	\$7.42	\$16.40	\$14.72	\$19.02	\$17.07	\$28.35	\$25.45	\$10.49	\$9.42	\$16.53	\$14.84
BLM	\$6.14	\$5.41	\$4.85	\$10.73	\$9.63	\$12.44	\$11.17	\$18.54	\$16.65	\$6.86	\$6.16	\$10.81	\$9.71
USFS	\$3.25	\$2.86	\$2.57	\$5.67	\$5.09	\$6.58	\$5.91	\$9.81	\$8.80	\$3.63	\$3.26	\$5.72	\$5.13
Total	\$30.78	\$27.08	\$24.31	\$53.74	\$48.24	\$62.32	\$55.95	\$92.90	\$83.40	\$34.37	\$30.86	\$54.17	\$48.63
BLM	\$18.93	\$16.66	\$14.96	\$33.05	\$29.67	\$38.33	\$34.41	\$57.14	\$51.30	\$21.14	\$18.98	\$33.32	\$29.91
USFS	\$11.85	\$10.43	\$9.36	\$20.68	\$18.57	\$23.99	\$21.54	\$35.76	\$32.10	\$13.23	\$11.88	\$20.85	\$18.72
BLM	\$18.93	\$16.66	\$14.96	\$33.05	\$29.67	\$38.33	\$34.41	\$57.14	\$51.30	\$21.14	\$18.98	\$33.32	\$29.91
RBF	\$9.47	\$8.33	\$7.48	\$16.53	\$14.84	\$19.17	\$17.21	\$28.57	\$25.65	\$10.57	\$9.49	\$16.66	\$14.96
Payments States/Countries	\$3.32	\$2.92	\$2.62	\$5.80	\$5.21	\$6.73	\$6.04	\$10.03	\$9.00	\$3.71	\$3.33	\$5.85	\$5.25
Receipts to Fed Treasury	\$6.14	\$5.41	\$4.85	\$10.73	\$9.63	\$12.44	\$11.17	\$18.54	\$16.65	\$6.86	\$6.16	\$10.81	\$9.71
USFS	\$11.85	\$10.43	\$9.36	\$20.68	\$18.57	\$23.99	\$21.54	\$35.76	\$32.10	\$13.23	\$11.88	\$20.85	\$18.72
RBF	\$5.92	\$5.21	\$4.68	\$10.34	\$9.28	\$11.99	\$10.77	\$17.88	\$16.05	\$6.62	\$5.94	\$10.43	\$9.36
Payments States/Countries	\$2.67	\$2.35	\$2.11	\$4.67	\$4.19	\$5.42	\$4.86	\$8.07	\$7.25	\$2.99	\$2.68	\$4.71	\$4.23
Receipts to Fed Treasury	\$3.25	\$2.86	\$2.57	\$5.67	\$5.09	\$6.58	\$5.91	\$9.81	\$8.80	\$3.63	\$3.26	\$5.72	\$5.13



years (102 percent, double the current estimated receipts of \$30.8 million), and \$25.2 million (82 percent) in 20 years.

A surcharge on subleasing and pasturing agreements might also increase grazing fee receipts. The extent of the impact would depend upon the types of arrangements (whether subleasing, pasturing agreement, or both) and the number of AUMs involved in such arrangements.

Table 4-6 also shows the distribution of receipts to Range Betterment Funds, payments to states and counties, and revenues to the U.S. Treasury. Assuming that the distribution of grazing fee receipts remains the same, these three categories would change by the same percentage. Grazing fee receipts are also shown separately for both BLM and the Forest Service.

Also see Table 2, Proposed Action, in Appendix Q, Total Grazing Fee Receipts After 5 Years and 20 Years Under Different Fee Alternatives, for total grazing fee receipts under all fee levels.

## Social Conditions

### Permittees

In the short term under the Proposed Action, the average permittee with 210 cows and a 30 percent dependency rate would experience a \$679 decline in income annually at the current fee level, \$2,289 at \$3.96/AUM, and \$3,686 at \$6.38/AUM (In comparison, under the Current Management alternative, the short-term declines in annual income would be \$284 at the current fee, \$2,022 at \$3.96/AUM, and \$3,530 at \$6.38/AUM). In the long term, the losses for the same average permittee would be \$1,187 in income annually at the current fee level, \$2,632 at \$3.96/AUM, and \$3,887 at \$6.38/AUM. (The comparable declines under the Current Management alternative would be \$1,127 at the current fee level, \$2,591 at \$3.96/AUM, and \$3,861 at \$6.38/AUM). (See Table 4-5, Impacts to Ranch Operations.) The size of the loss for any permittee would depend on the size of the ranch, the dependency on federal forage, the amount of forage lost, and the grazing fee. The effect of the loss on any individual permittee would vary, depending on the size of the loss, the financial condition of the operation, the price of beef, operating costs, and the dependence of the ranch family on the operation.

While the proposed rule would move toward greater equity among fees, it would still result in a fee below the fees charged for grazing on State lands in most western States, and would fall well below private grazing land lease rates. The amount by which the fee would increase is similar to recent increases that have taken place at the State level; those increases have not led to noticeable shifts in the livestock industry or economic effects on communities in those States. This, when considered with the reasonableness of the proposed fee increase and the fact that more than 73 percent of BLM permittees and lessees would experience a fee increase of less than \$1,000 per year, offers evidence that the proposed change in the fee would generally not have a significant impact on the stability of the dependent western livestock industry and would not have a serious detrimental effect on most permittees and lessees. Some permittees and lessees that are highly dependent on Federal forage, do not have off-ranch income, and have heavy debt loads may be required to make some financial adjustments. These adjustments, in some circumstances, may include sale of the ranch; however, it is expected that such sales will occur in limited circumstances. Such sales, it should be noted, are occurring and will continue to take place under current conditions, as well.

The economic impact on western communities is expected to be localized and, in most areas, not significant because that portion of the local economy that depends upon the use of Federal forage is relatively minor.

Under the Proposed Action at all fee levels, losses in income would be similar to losses under Current Management. But changes in regulations under the Proposed Action might also require permittees to more intensively manage their operations—move cattle more often and maintain more fencing. Representing a change in emphasis from Current Management, the Proposed Action would result in more of the social consequences described in the Impacts Common to All Alternatives Section at the beginning of Chapter 4 than would Current Management.

Permittees are specifically concerned about the reductions in forage, the broadened representation on advisory boards and councils, BLM ownership of all future range improvements, surcharges for subleasing, and declines in permit values that would reduce ranch values. From the perspective of many in the ranching community, the Proposed Action, particularly at a



higher fee level, would intensify some of their feelings of mistrust and loss of personal control and would further threaten their lifestyles. The resulting negative attitudes toward BLM and the Federal Government in general would make it more difficult for BLM to work with permittees. On the other hand, Multiple Resource Advisory Councils will provide a forum for permittees, other public land users, and BLM to build consensus.

## Counties and Communities

Job losses at all fee levels would be insignificant at the westwide level. Some of the projected declines in employment would be absorbed through retirements and people seeking other types of work in the normal course of their lives.

Westwide in the short term under the Proposed Action, 1,680 jobs would be lost at the current fee level, between 2,050 and 2,170 jobs would be lost at \$3.96/AUM, and 2,710 jobs would be lost at \$6.38/AUM. In the long term, 2,760 jobs would be lost at the current fee level, between 3,090 and 3,200 jobs would be lost at \$3.96/AUM, and 3,680 jobs would be lost at \$6.38/AUM. These losses represent jobs in all sectors of the economy—ranch employment and jobs that directly and indirectly relate to ranching. Under the Proposed Action, more jobs would be lost than under Current Management.

The Proposed Action's effects could include the outmigration of some permittee families whose operations or businesses could not support them. The level of outmigration would depend on the financial condition of the permittees, their job skills, and employment opportunities in the local area. "Typical small communities" (as described in Chapter 3) are most likely to be affected under this alternative because they are now losing population and cannot respond well to change.

In other areas, such as Gunnison County, Colorado, population declines from permittee family outmigration might be offset by people moving into the area as part of the rural development trend. New people might have different attitudes and values than the people leaving the area and would probably place less importance on the traditional values of ranching families. The potential effects of job and popula-

tion loss on local communities are described in the Social Conditions discussion of the Impacts Common to All Alternatives section at the beginning at Chapter 4.

Grazing fee increases would be highest in areas with a high average dependency on federal grazing, such as Gunnison County. The effects of these fee increases would depend on the financial condition of local ranches and local economic conditions. In areas where there are few permittees, the community population is large, and the economy is diverse, fee increases would be insignificant at the county and community level.

In many communities such as Rawlins, Wyoming, permittees and many residents would be concerned about the change in emphasis away from livestock management. Although recreation quality would improve, local recreationists and those promoting recreation as a way to diversify the local economy would probably not favor the Proposed Action because of its potential to harm permittees and the community.

In areas where rural development is occurring, there is a concern among ranchers and some newcomers that Rangeland Reform '94 will accelerate the urbanization process.

In areas where the population is more diverse, such as Gunnison County, the Proposed Action would probably appeal to newcomers, environmentalists, recreationists, and those interested in tourism. Because it might harm some permittees, recreationists and environmentalists who fear the loss of recreation access and open space from development might not support the Proposed Action. In the short term, differences in opinions and values among community groups could result in less cooperation and support among groups within these communities.

Residents would tend to attribute any sale of a permittee operation to changes in livestock grazing on federal lands, even if the sale resulted from other factors. Permittees and other residents might increasingly resent and distrust the Federal Government. But most permittees would continue to run their ranches, and the open spaces and rural lifestyle that most county residents value would remain largely intact. Therefore, the social effects of the Proposed Action, including community divisiveness and a feeling of lack of control, would diminish over time.



## National Impacts

Increasing numbers of people in the West and across the country believe that rangeland management should emphasize protecting rangeland resources rather than managing livestock. The Proposed Action is consistent with these attitudes. People who favor the Proposed Action would feel satisfied about government in general, BLM and the Forest Service, and the policymaking process. Raising Grazing fees would be consistent with these attitudes.

Some recreationists and environmentalists would believe the Proposed Action offers a proper balance between livestock grazing and protecting wildlife and riparian areas. Others, however, might feel that the Proposed Action does too little to protect these areas. Generally, people living close to the affected communities would support the livestock industry more than those living further away.

Increasing numbers of people across the country, including some ranchers who are not permittees, feel livestock grazing fees should be increased. Raising grazing fees would be consistent with these attitudes.

## Mitigation

The following mitigation is proposed to achieve higher rates of improvement in riparian and other areas with important resources while rewarding good stewardship with more responsibility and management flexibility and longer permits tenures. This mitigation would also respond to scoping comments that urged BLM to focus its management on areas most in need of improvement and that questioned how the agencies will fund a new management when they are already underfunded.

Applying only to BLM-administered lands, this mitigation would focus BLM employees and resources on riparian areas that are nonfunctioning or functioning but susceptible to degradation or on important uplands with similar problems.

Elements of the Proposed Action would be applied to BLM public lands in one of three ways.

1. Intensive management would focus on about 5,000 allotments involving 84 million acres.

- Regional standards and guidelines would (1) provide minimum environmental standards centered on the concept of properly functioning systems, (2) require that actions be taken immediately to correct nonfunctioning systems, and (3) require that actions also be taken to improve the health of systems that are functioning but susceptible to degradation.
2. Administrative efficiency could affect about 10,000 BLM allotments and 18.5 million acres where BLM would act to improve efficiencies in the following areas:

- Areas with scattered, isolated tracts of public land, where present management is accomplishing the desired results.
- Areas where ecological condition is acceptable.
- Areas with few resource use conflicts or controversies.
- Areas with low forage production capabilities, or areas producing near their potential.
- Areas where the land is producing near its potential.
- Areas lacking opportunities for positive economic return from public investments or whose opportunities are constrained by technological or economic factors.

In such areas the following actions would be taken to improve efficiencies:

- A 10-year permit would be issued, and the permittee would be billed at the beginning of the term for the entire 10-year period.
- BLM's presence would be slight.
- Little monitoring would be required.



In these situations, the grazing permit's terms would outline the basic requirements. As long as the permittee followed these terms, the 10-year incremental authorization would continue.

3. Flexibility provisions would allow BLM to build good relationships with permittees by rewarding good stewardship with long-term leases, management flexibility, and a reduced BLM presence. This provision could affect up to 5,500 BLM allotments and about 42 million acres.

Areas that are properly functioning as a result of the permittee's good stewardship would be eligible for operating under an agreement that would give the permittee the greatest flexibility with the least BLM involvement or supervision except for periodic consultations and compliance checks.

BLM would fulfill its responsibilities under laws and regulations but would select areas for this provision through an open process with public involvement in compliance with the National Environmental Policy Act. Local communities would be involved through multiple resource advisory councils, which would play lead roles in decisionmaking.

## ***Alternative 3: Livestock Production***

### **Grazing Administration**

#### **Livestock Use Levels**

The background trends shown in BLM and Forest Service statistical reports (BLM 1992a; FS 1993a) and discussed under Current Management are expected to continue under the Livestock Production and other alternatives. The short-term trend would be similar to that under Current Management in that forage grazed is projected to decline by 4 percent for both agencies. But as the focus of resource management shifts from multiple use to livestock production, vegetation manipulation and range improvements

would allow more forage to be produced for livestock, partially offsetting long-term trends projected for Current Management. (See Figure 4-11.) Forage consumed on BLM-administered lands would decline by 10 percent in the long term. Forage consumed on National Forest System lands would decline at a sharper rate—14 percent—because these lands have less potential to grow more forage through vegetation manipulation.

Under Livestock Production, the national trend in federal forage consumed by livestock over a 20-year period would continually decline. The trend in the Columbia Basin, however, would at first decline but then increase slightly above existing conditions. The increased forage would result from seeding nonfunctioning areas to perennial grasses.

### **Program Efficiency and Effectiveness**

BLM's workload would increase in the short term as it develops and implements regional standards and guidelines, including regional National Environmental Policy Act (NEPA) analyses. But under Livestock Production, regional standards and guidelines, with agency employees, permittees, and grazing advisory boards as the main participants, would probably be developed faster than under a broad multiple interest approach. The resulting standards and guidelines would focus more on livestock forage and watershed conditions and less on other resource issues such as wildlife, biodiversity, and sensitive species.

In the long term, regional standards and guidelines would help to focus BLM management direction within each region and would improve agency efficiency in meeting management objectives.

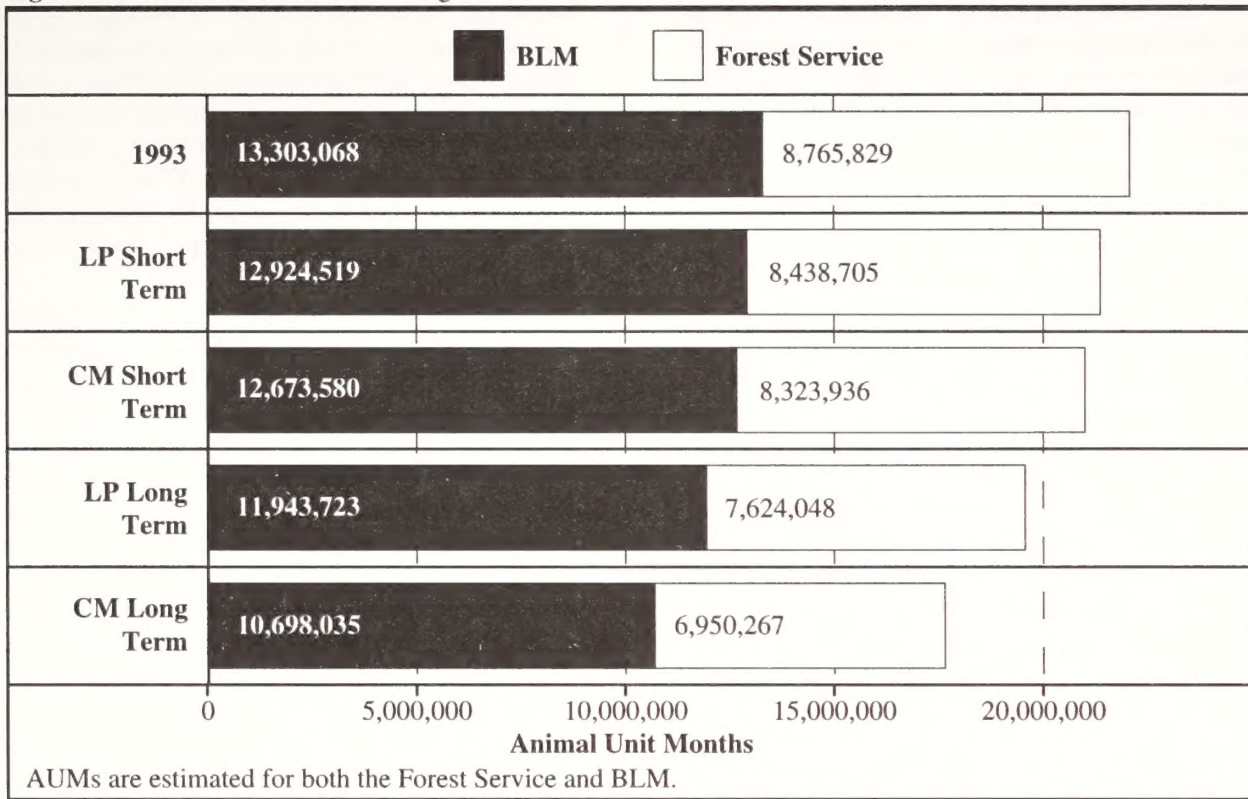
Other aspects of this alternative would have mixed effects on agency efficiency and effectiveness. Changes in grazing regulations relating to nonuse, conservation use, grazing advisory boards, and range improvement ownership would tend to allow BLM and the Forest Service to more efficiently administer their rangeland programs. Aspects relating to the use of Range Betterment Funds and appeal provisions, however, would make the agencies less efficient in accomplishing resource management objectives.

Under Livestock Production, BLM and the Forest Service would encourage permittees and applicants to follow the conditions of permits





**Figure 4-11: Available Livestock Forage in Animal Unit Months, Livestock Production Alternative**



by requiring them to have satisfactory performance records to obtain grazing permits and disqualifying them if their permits have been canceled for violating agency regulations.

The number of grazing transfers on Forest Service-administered lands would significantly increase due to increased leasing. Workloads would increase when the Forest Service begins to authorize base property leases and livestock pasturing agreements.

Under Livestock Production, BLM and Forest Service regulations would be more alike than at present, making it easier to coordinate management on adjoining lands.

The Livestock Production alternative would have the following other impacts.

- Authorizing grazing advisory boards to determine the validity or appropriateness of base property and livestock leases would lessen BLM's administrative workload.
- Issuing 20-year permits to good stewards would reduce the administrative workload of reissuing permits.

- Allowing nonmonetary settlements for incidental unauthorized use would improve the efficiency of BLM and Forest Service employees and reduce their administrative workload.
- Tracking and maintaining records of suspended nonuse would continue to create administrative inefficiency. Personal and political pressure to reinstate suspended nonuse would create even more inefficiency.
- Requiring the Forest Service to work with grazing advisory boards in setting priorities for the use of Range Betterment Funds would add to this agency's workload.
- Changing the Forest Service's water rights policy would improve the consistency between BLM and the Forest Service.

Under Livestock Production as under Current Management, appealed BLM grazing deci-



sions would be automatically stayed from implementation until any appeals are resolved.

The time and money spent by the agencies would be greatly reduced by transferring administrative roles to grazing associations formed by grazing advisory boards. These responsibilities would include resolving unauthorized use, enforcing permit compliance, and collecting grazing fees. Agency positions would shift away from administrative duties.

Management under the Livestock Production alternative would emphasize local livestock production and cultural and traditional values. Grazing advisory boards would influence the development of goals and objectives. If these goals did not recognize natural resource management, either to sustain or improve resource conditions, interested publics would likely appeal agency decisions to implement prescribed management. These appeals would increase agency workloads and decrease agency effectiveness in managing resources and efficiency in carrying out other duties.

## Availability and Use of Range Betterment Funds

The amount of Range Betterment Funds going to BLM and the Forest Service under the Livestock Production alternative would depend on the grazing fee formula selected for implementation. For example, if the current grazing fee formula is retained, Range Betterment Funds would decline over the long term by 12 percent (from a 3-year average of \$15.4 million per year to \$13.5 million per year). This decrease would result from a projected decline in livestock use on federal lands and an accompanying decline in grazing fee receipts.

A 12 percent decrease in Range Betterment Funds, coupled with rising costs for range improvements, would allow far fewer range improvements to be built in the future. Furthermore, this funding would continue to be needed to maintain and rebuild existing projects where the agency has the responsibility, and in the long term would be insufficient even for maintenance.

Alternative sources of funding, including increased permittee contributions, agency appropriations, and contributions from other sources, would become more important just for maintaining the current level of management. Without such funding, some existing fences and

water development for livestock grazing on public lands would eventually fall into disrepair, and livestock use would become increasingly difficult to manage. Fewer allotment management plans would be implemented each year, and progress in meeting resource management objectives would be slowed. Riparian habitat and other resource conditions would increasingly deteriorate and could eventually result in the need to reduce livestock use even more than currently projected.

Since spending priorities for Range Betterment Funds would be determined by grazing advisory boards, funding would generally be targeted toward maintaining and rebuilding existing projects that favor livestock forage production and use. Few or no Range Betterment Fund dollars would be devoted solely to other resource management objectives.

Under the BLM-Forest Service proposed grazing fee formula or regional fees, Range Betterment Funds would increase by 102 percent (to \$31.2 million per year) or 202 percent (to \$46.5 million per year) respectively. Such large increases in Range Betterment Funds would more than offset rising costs of range improvements and would generally mean that more range improvements could be built, maintained, and rebuilt.

Because grazing advisory boards would determine spending priorities for Range Betterment Funds, most projects would favor livestock forage production and use. Large investments in vegetation treatments, such as prescribed burning, chaining, and similar projects, would increase. But given the size of potential increases in Range Betterment Funds, a small portion might be devoted to resource monitoring or to other resource management objectives.

The net result of higher funding levels over the long term would be a substantial increase in the agencies' abilities to implement, maintain, and rebuild range improvements aimed at a relatively narrow range of resource management objectives. The need for alternative sources of funding would correspondingly decrease.

## Vegetation

Under the Livestock Production alternative, permittees wanting a 20-year permit would have to apply livestock management practices that would improve rangeland conditions. But the extended length of permits, once obtained,



could act as a disincentive, allowing permittees to avoid further compliance with permit conditions.

Developing livestock management plans with grazing advisory boards and permittees instead of a broader range of interested publics would not greatly affect the overall health of upland vegetation communities but might result in less emphasis at the ground level on managing vegetation for such needs as wildlife, threatened and endangered species, and recreation.

As under Current Management, BLM under the Livestock Production alternative would immediately implement resource decisions in emergencies to stop resource deterioration. The automatic staying of all other appealed decisions would lead to the continued short-term decline in vegetation conditions until the appeal has been resolved and better management is implemented. Impacts would be significant on a local basis as problems occur.

Ecosystem goals and objectives would be developed mainly through consultation with grazing advisory boards and with a strong emphasis on the human use of rangeland ecosystems. The resultant management would fall

short of meeting the vegetation requirements of a well-balanced ecosystem. Equal emphasis would not be placed on the requirements of upland vegetation for nonhuman needs such as wildlife, wild horses and burros, and threatened and endangered species.

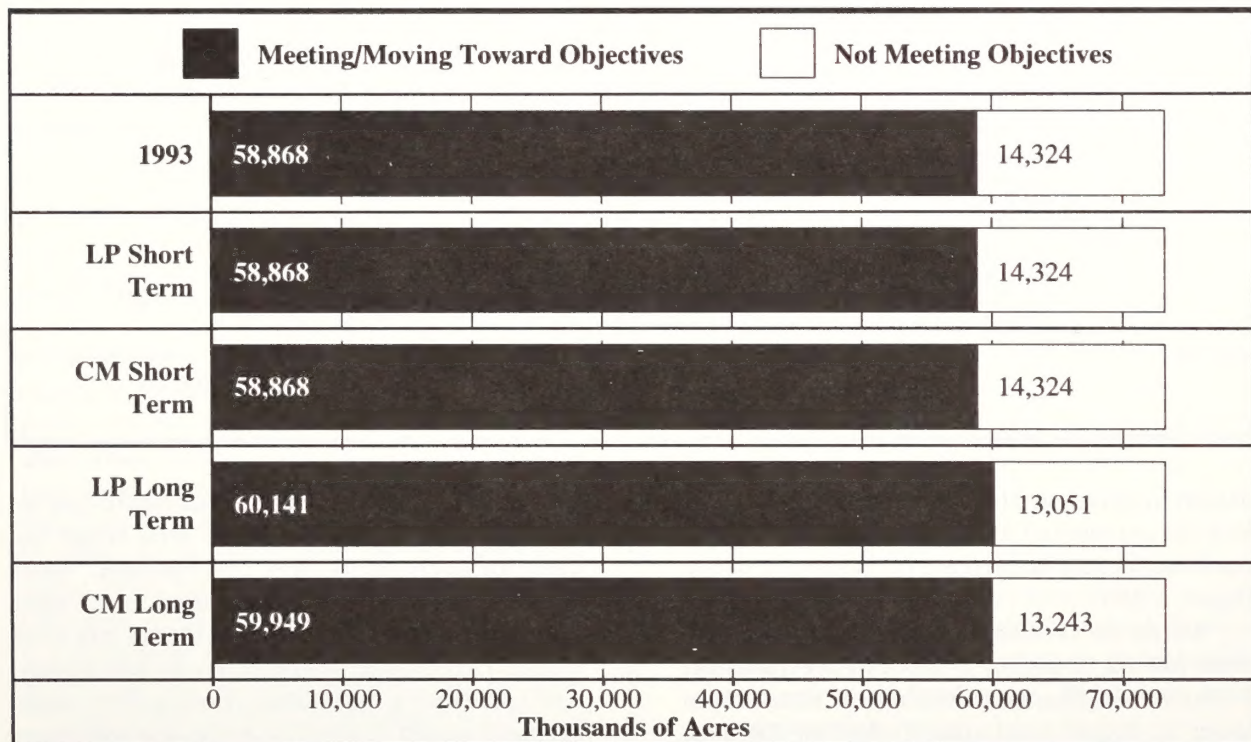
## Upland

In the long term, about 60,141,000 acres (82 percent) of Forest Service uplands would either be meeting objectives or moving towards objectives (an increase of 2 percent from 1993). Another 13 million acres (18 percent) would not be meeting objectives (a decrease of 9 percent from 1993). (See Figure 4-12.)

In the short term, BLM upland acres in proper functioning condition would slightly increase, upland acres functioning but susceptible to degradation would slightly decrease, and upland acres in nonfunctioning condition would also slightly decrease.

In the long term, about 129 million acres (81 percent) of BLM upland acres would be in proper functioning condition (an increase of 40 percent). Another 12.5 million acres (8 percent) would be functioning but susceptible to degra-

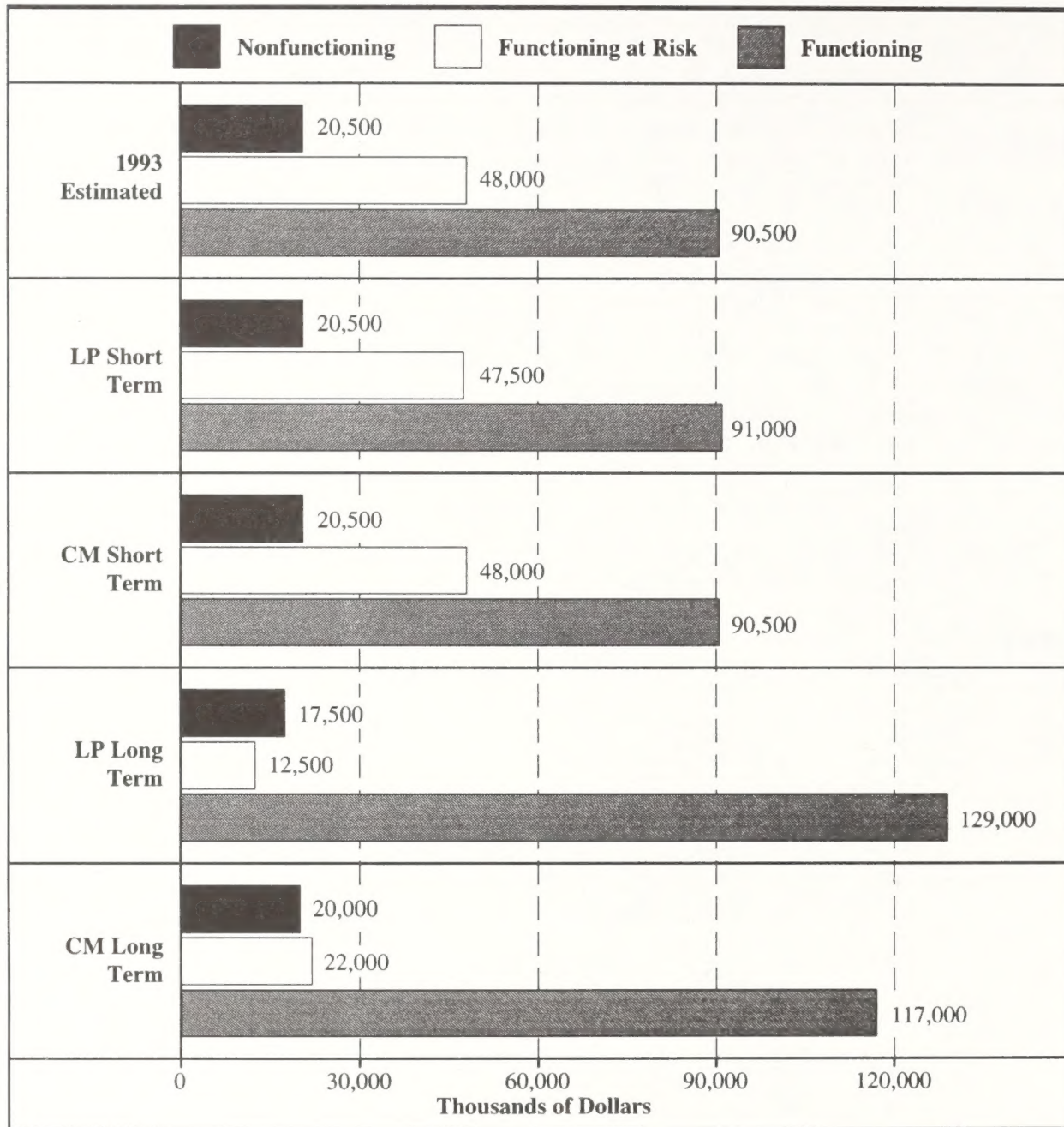
**Figure 4-12:** Change in Status - Forest Service Uplands, Livestock Production Alternative







**Figure 4-13: Changes in Functioning Condition - BLM Uplands, Livestock Production Alternative**



duction (a decrease of 75 percent), and 17.5 million (11 percent) of BLM upland acres would be nonfunctioning (a decrease of 15 percent). (See Figure 4-13.)

Under the Livestock Production alternative, areas having 12 inches or more of precipitation a year would change in ecological status from lower to higher seral stages. And in the long term the vegetation in some areas would decline

from potential natural communities to late seral stages and from late to mid seral stages because of overgrazing, fire, and drought. Most improvement would occur on areas in the early seral stages moving into the mid and late seral stages. This change would differ by administrative area since a vegetation community's management would depend on achieving objectives that differ according to resource needs.



## **Sagebrush**

General conditions and trends of sagebrush communities would improve under Livestock Production. The density of sagebrush and other brush would decrease because rangeland management would emphasize watershed improvement and livestock forage production.

Changes in ecological condition and trend would depend on the site and the treatment. For sites in lower seral stages because of excessive brush, management would try to increase the amount of grass to place the area at a higher seral stage. Typical improvement strategies would include burning or such mechanical treatments as chaining or riling.

Sagebrush areas having less than 12 inches of annual precipitation would not improve significantly except for nonfunctioning areas receiving vegetation manipulation treatments. These areas would probably be seeded with perennial grass-forb mixes and would improve to proper functioning condition. Without treatment, trend in the lower precipitation areas would not significantly change in the long term.

In the short and long term under Livestock Production, most sagebrush communities on Forest Service-administered lands would continue to meet or move toward management objectives at the same rate as under Current Management. Most sagebrush communities would be meeting objectives in the long term because most are in the 16 inch and above precipitation zones. Higher precipitation and better soils would allow these communities to improve to meet management objectives.

## **Desert Shrub**

Ecological condition would not significantly change in the Mojave and Sonoran deserts, where plant communities consist largely of unpalatable shrubs and annual forbs. Climate, particularly long periods of hot temperatures and low precipitation, would help slow the movement of plant communities from low to higher seral stages. Plant litter and canopy cover of the more palatable shrubs would decrease. Revegetation is a long-term process that cannot be induced in this low precipitation and high salinity zone.

The potential of the alkali desert shrub (cold desert) community to move to higher seral stages is slightly better than that of hot desert

communities, precipitation remaining a key limiting factor in the change. But the Livestock Production alternative would improve vegetation condition because of its increased emphasis on helping vegetation communities dominated by herbaceous plants. With management improving as a result of regional standards and guidelines and the emphasis on preserving special status plants and animals on these sites, vegetation condition would slowly improve. Most livestock permittees want their children to inherit ranches in better condition than when acquired and realize that they cannot reach this goal through heavy grazing (Holechek and others 1989).

## **Southwest Shrubsteppe**

Under the Livestock Production alternative, the trend of increasing ground cover of grasses would continue. The condition of the shrubsteppe ranges of southern New Mexico and southeast Arizona has been improving since the drought of the 1950s, when grass cover declined by as much as 75 to 90 percent. Since the 1950s increased grass cover has resulted from favorable rainfall and management changes. Although the general trend would be to increase grass cover, the response would vary depending on site characteristics and weather patterns. Sites with harsh growing conditions would not improve much in 20 to 30 years. Many sites would continue to be dominated by shrubs unless they are controlled by chemical or mechanical methods (Holechek and others 1989).

## **Chaparral-Mountain Shrub**

Under Livestock Production, stands of scattered shrubs would have an upward trend, but dense stands would not change without fire or other treatment. Vegetation projects would increase.

## **Pinyon-Juniper**

Stands of scattered pinyon-juniper would have an upward trend under Livestock Production, but dense stands would not change without fire or other treatment. Vegetation treatments would increase.



## *Mountain and Plateau Grasslands*

Over the long term, the Livestock Production alternative would slowly increase palatable grass, forbs, plant vigor, and vegetation litter.

## *Plains Grasslands*

As climate allows, plains grasslands would gradually trend upward in succession. Wheatgrasses and needlegrasses would increase in composition relative to blue grama, Sandberg bluegrass, prairie junegrass, and sedges. Where clubmoss or blue grama prevail, sites are not likely to change without disturbance. Mainly sites near the upper end of the seral stage would move to the next seral stage.

Livestock would closely graze nonriparian wooded draws under season-long use. Although grazing would continue to be heavier in these draws than in surrounding areas, periodic rest from grazing and reduced time of grazing would benefit these areas more than adjacent higher areas that have traditionally been more lightly grazed. Under continuous summer grazing, these wooded draws would change or undergo a downward trend because tree seedlings could not become established.

## *Annual Grasslands*

Palatable annual grasses, annual forbs, vigor, and vegetation litter would slowly increase over the long term.

## *Alpine Grasslands*

Alpine ecosystems would not change significantly under the Livestock Production alternative.

## *Coniferous and Deciduous Forests*

Under Livestock Production, undesirable species such as firs would continue to invade deciduous areas, but coniferous forests would not change much.

## *Riparian/Wetland/Aquatic*

Establishing regional standards and guidelines would result in inconsistent resource management. Standards and guidelines would most likely emphasize the needs of livestock permit-

tees rather than ensuring the management of sustainable resources other than watershed stability and livestock forage conditions. Although riparian area condition would improve in limited areas, overall riparian resource condition would continue to decline.

The Livestock Production alternative would greatly expand the role of grazing advisory boards, which would consist of livestock permittees. Management emphasis would concentrate on issues benefitting the livestock industry and maintaining forage condition and availability. Although regional standards and guidelines might recognize the value and need to restore riparian resources, many grazing advisory boards would not support hard decisions to better manage livestock for riparian protection. By reducing options and narrowing the focus of resource management, grazing advisory boards under the Livestock Production alternative would contribute to the continued decline of riparian area condition. (See Figures 4-14 and 4-15.)

Management under the Livestock Production alternative would consider sustainable diversified ecosystems to be secondary to the socioeconomics of western livestock production. Without the maintenance of ecosystem integrity as the basis of management, BLM might not be able to maintain functioning ecosystems, and overall riparian resources would decline, further reducing biodiversity.

In the long term, 1,527,902 acres (about 70 percent) of Forest Service riparian areas would either be meeting objectives or moving towards objectives (a decrease of 10 percent from 1993); another 663,357 acres (30 percent) would not be meeting objectives (an increase of 37 percent from 1993).

In the long term, 324,900 acres (about 32 percent) of BLM riparian areas would be properly functioning (a decrease of 8 percent from 1993). Another 460,800 acres (45 percent) would become functioning but susceptible to degradation (a decrease of 2 percent from 1993). About 242,700 acres (24 percent) would be nonfunctioning (an increase of 18 percent from 1993).

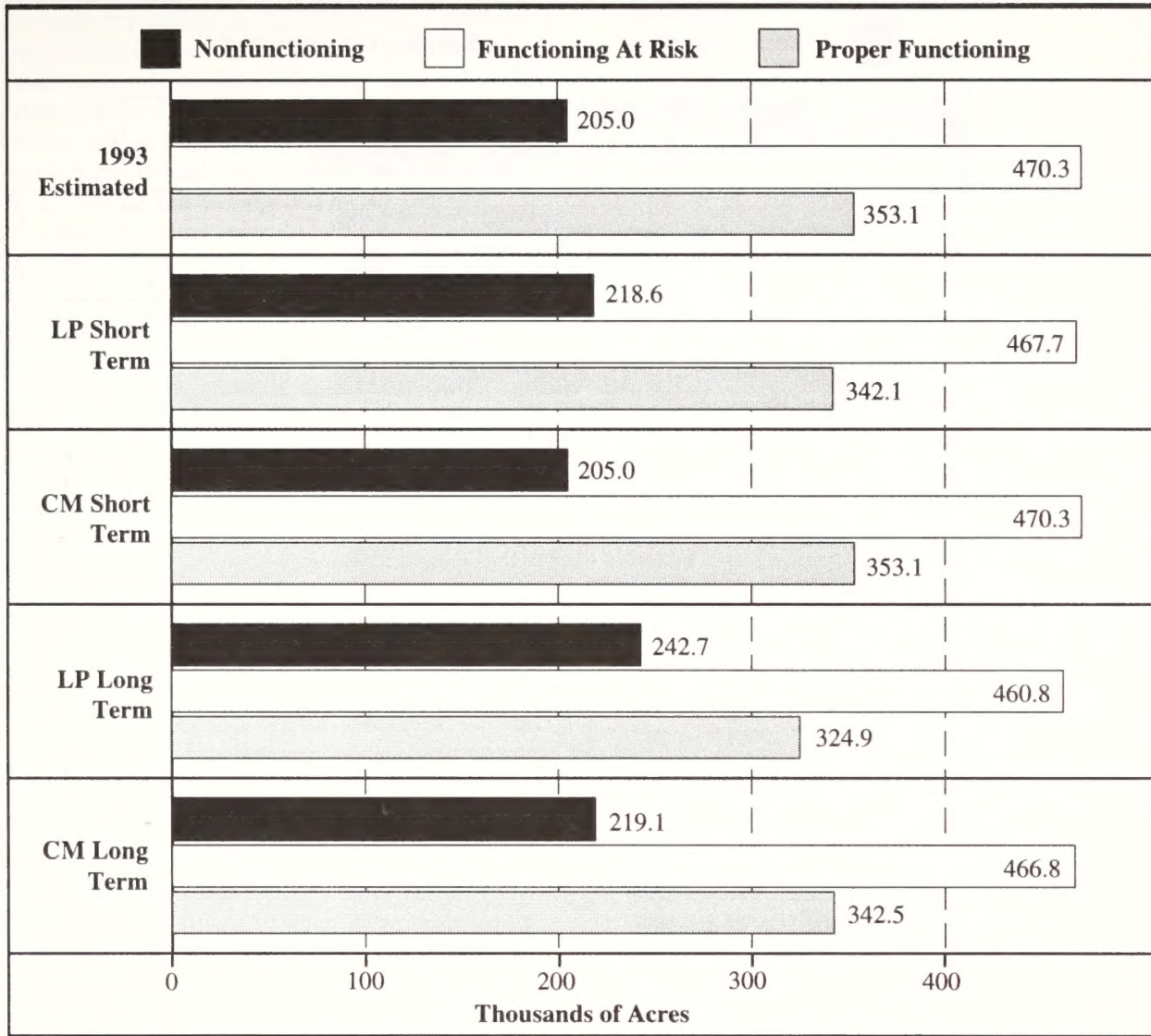
Grazing impacts to mountain meadows would be accelerated as a result of the great emphasis placed on improving livestock forage and watershed conditions on uplands.

For the short to mid term, mountain meadows would continue to experience loss of wa-





**Figure 4-14: Changes in Functioning Condition - BLM Riparian, Livestock Production Alternative**



tershed function; lowering of water tables; and an invasion by undesirable trees, shrubs, forbs, and annuals. Within the long term, as regional and local standards and guidelines are implemented, residual plant material, especially grasses, sedges, and forbs, would notably increase.

## Watershed

### Upland

With climatic variations being the dominant influence, watershed condition under the Livestock Production alternative would change little in the short term. In the long term, uplands

would remain static or slowly improve at a steady rate due to increased vegetation and litter cover, improved physical soil properties, and a corresponding decrease in runoff and erosion. (See Figures 4-12 and 4-13 for short- and long-term estimates of upland conditions in BLM- and Forest Service-administered lands.)

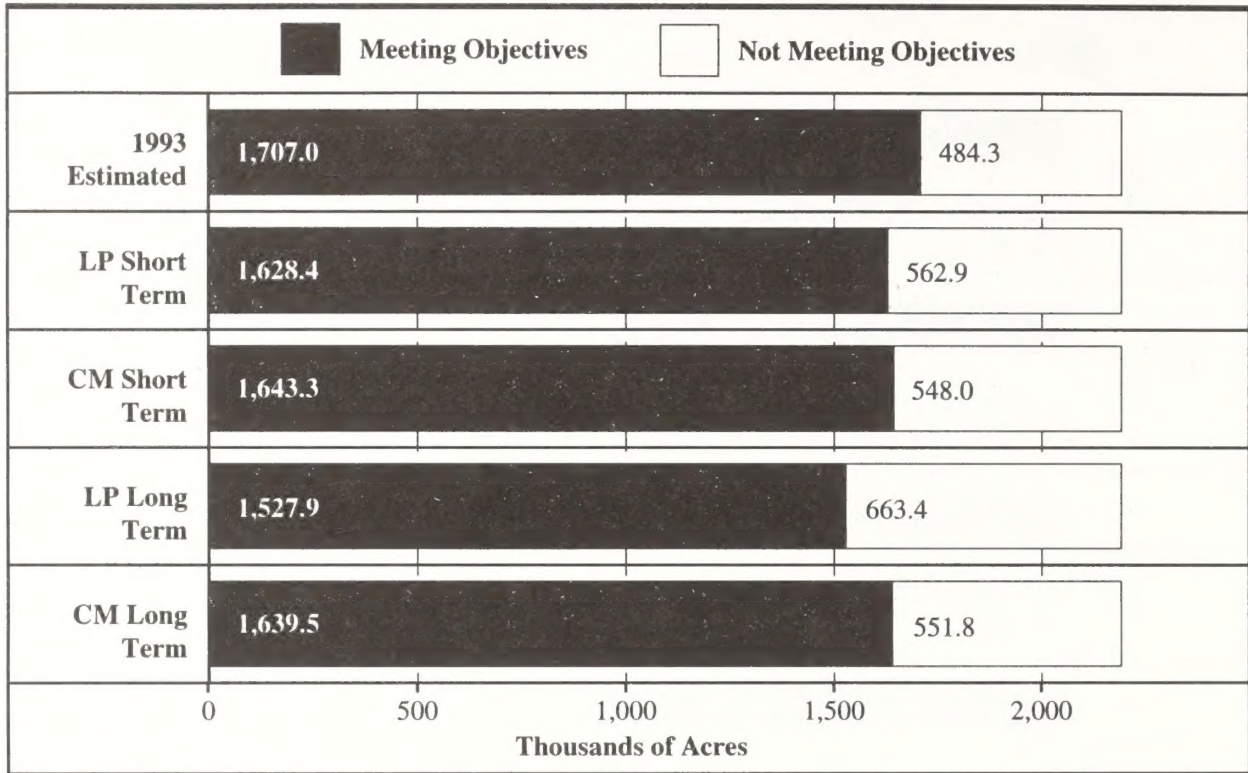
The upland gully network would respond slowly to these improvements, and many upland areas would not improve much. As a result, the size and frequency of runoff events would not change in many areas.

The desert shrub, pinyon-juniper, and sagebrush communities with less than 10 inches of precipitation would respond slowly to management actions.





**Figure 4-15: Change in Status - Forest Service Riparian, Livestock Production Alternative**



The uplands within the Rocky Mountains and High Plains analysis area would remain static or improve at a slow, steady rate. Some areas, however, would not achieve proper functioning condition within the long term. Grazing management would be the tool most commonly used to improve upland watershed conditions on areas that are functioning at risk. Nonfunctioning areas would be improved through a combination of grazing management and a reduction in livestock grazing.

Overall under the Livestock Production alternative, nonpoint-source pollution from livestock would remain at existing levels in uplands. The emphasis on livestock production at or near current levels would retard the recovery of vegetation and ground cover on nonfunctioning uplands while maintaining accelerated rates of erosion and overland flow. As a result, sediment yields and other pollutants (fecal bacteria, salinity, and nutrients) carried by overland flow would remain at existing levels. Nonpoint-source salinity in the Colorado River basin from arid-desert shrub communities would also continue at existing rates in both the short and long term.

Regional standards and guidelines would focus on livestock forage and watershed conditions and somewhat less on other resources such as sensitive species, wildlife, and biodiversity. Without national requirements, BLM would not have an umbrella of uniformity for regional standards and guidelines.

### Riparian/Wetland/Aquatic

With the emphasis on livestock production, grazing would continue at or near existing levels. Uplands that are either nonfunctioning or functioning but susceptible to degradation would improve little in vegetation and ground cover conditions. Consequently, erosion and runoff rates from uplands would continue to accelerate over the short term and slightly diminish over the long term. Accelerated runoff and sediment yield would result in unstable channel conditions. Only a minority of riparian-stream systems would improve under management plans. (See Figures 4-14 and 4-15.)

Continuing to graze near existing levels, livestock would congregate in and overgraze riparian areas. Sediment produced from livestock



trampling of streambanks and riparian areas would slightly increase over the long term. Livestock disturbance would continue to alter stream channel structure, resulting in widened or incised channels. As a result, the beneficial hydrologic functions of these riparian areas (floodplain function, water quality maintenance, flood peak reduction, and groundwater recharge) would remain nonfunctioning or functioning but susceptible to degradation.

Riparian systems whose shrub and tree communities have low vigor and poor reproduction success from past and present livestock use would continue to produce sediment at rates at or above existing levels. Grazing disturbance would slightly increase sediment rates from channels being widened or incised. A continued decline of woody vegetation in riparian areas would result in warmer water temperatures and lower dissolved oxygen levels.

Nonpoint-source pollution from riparian areas would vary from the direct disturbance of continued livestock grazing at or near existing levels. With livestock congregating in and overusing riparian areas, fecal pathogens and nutrient enrichment, being directly correlated with livestock numbers, would continue at or near existing levels. Sediment produced from trampling of streambanks and riparian areas would remain near existing levels through the long term. Sediment at or slightly above existing levels would be produced by stream-riparian systems with low-vigor shrub and tree communities or unstable channels resulting from livestock use.

Allowing nonpoint-source pollution to continue at or above existing levels would conflict with the expected increase in recreation on public lands, especially where drinking water or primary and secondary contact recreation waters are involved.

Since livestock grazing is not widespread in the Coastal analysis area, under the Livestock Production alternative, nonpoint-source pollution from livestock would be restricted to local areas.

Over the short term, Livestock Production would benefit the upland areas most sensitive to public pressure. Watersheds would be improved where livestock grazing and the environment would benefit. More money and emphasis would be placed on grazed sites that are not functioning properly. In local watersheds where livestock grazing is the main economic use, con-

tinued grazing would degrade the habitat over the long term, especially if economic interests influence implementing ecosystem management decisions.

## Wildlife

Under the Livestock Production alternative, current trends for both upland and riparian vegetation communities would continue much as they have in the past decade.

Independent regional standards and guidelines would result in inconsistent grazing management among field offices. This inconsistency would contribute to the long-term decline in riparian-dependent wildlife, including waterfowl, fish, and raptors.

Current livestock grazing regulations would limit BLM to penalizing grazing permittees who are convicted of violating the Endangered Species Act and Bald Eagle Protection Act. The much broader Forest Service regulations, covering most environmental protection and state wildlife laws, would benefit some local wildlife populations.

The inability to control water rights under the Livestock Production alternative could inhibit BLM and the Forest Service from redirecting water to benefit wildlife. Many water developments for livestock grazing on public land do allow wildlife access through either ramps or overflow. Where the agencies do not own the water right, it could be shut off when livestock are absent but wildlife would otherwise use them.

The Livestock Production alternative could allow the privatization of water on public lands and reduce habitat quality by promoting wildlife-livestock conflicts. These direct impacts would result from intense use around important water sources and reduced forage and vegetation cover. Diverting water to increase the distribution and intensity of livestock would also increase livestock-wildlife conflicts.

## Big Game

The Livestock Production alternative would maintain local habitat diversity through land treatment and natural events. The general vegetation changes would favor species in upper seral stages. For example, in areas occupied by elk and mule deer, elk would be favored where



cover moves toward greater grass density. Big game populations would then move toward stability in the long term but would occupy different proportions of habitats than they do now. These vegetation trends would favor bighorn sheep and elk, whereas pronghorn antelope and mule deer habitat conditions would generally decline due to a shift from brushy to herbaceous vegetation.

The quality of riparian-dependent big game habitat would decline and become less capable of maintaining populations. These species would have to rely on less-desirable habitats to replace riparian habitat component functions.

### Upland Game and Nongame

The Livestock Production alternative would consider the socioeconomic interests of livestock grazing more important than maintaining ecosystems rich in biodiversity and would set standards and guidelines at a local or regional rather than national level. When agency decisions would not allow broad-scale, long-term upward trends in meeting habitat requirements in riparian and upland areas, upland and nongame populations would decline.

Local decisions would also determine the relative rate of upward or downward trend for riparian and upland vegetation communities and would not be effectively analyzed or compared to the other alternatives. But the rate of development of such guidelines would also be important in determining impacts on upland game and nongame. The slower that guidelines are developed, the longer the current trends for vegetation communities would continue. Consequently, upland and nongame population trends would continue much as under Current Management, with a few populations increasing, some remaining stable, and a significant portion declining.

While some riparian areas would improve in response to local management priorities, the overall declines would place more pressure on the upland and nongame species from a shrinking or degrading resource base. The overall decline in riparian vegetation condition (see Figures 4-14 and 4-15) would reduce water, nesting habitat, roosting habitat, forage, and cover for upland game and nongame. This decline would limit upland game and nongame populations even though upland habitat would improve.

### Waterfowl

Under the Livestock Production alternative, BLM and Forest Service, by focusing on sustaining levels of livestock use and upland forage, would reduce management alternatives and result in an overall long-term decline of waterfowl nesting and brood-rearing habitat on 3.9 million acres and along 112,000 miles of streams.

In the long and short term, ecological conditions would be worsened by implementing local standards and guidelines. Local management for commodities would de-emphasize ecosystem management and biological diversity. Unmanaged, heavy livestock grazing on wet meadows would reduce nesting and cover habitat. In the short term, by removing protective palatable plant cover, livestock grazing would allow unpalatable plants to increase. In addition, hoof action and trampling would continue to damage soil structure. In the long term these direct adverse impacts would accelerate erosion, modify stream channels, and reduce water quality, all harming waterfowl habitat.

### Raptors

Under the Livestock Production alternative, restoring sustainable ecosystems would be secondary to local socioeconomic considerations. Although regional standards and guidelines would be designed to improve upland or riparian habitats, livestock production would clearly be emphasized. Impacts to raptors would be similar to those under Current Management except in riparian areas, where impacts would be more harmful.

Habitat conditions would change slowly in arid uplands. A slight improvement in uplands would result in slight increase of raptors that depend on the drier upland habitats for hunting, such as ferruginous hawks, golden eagles, prairie falcons, and burrowing owls.

Under Livestock Production, the long-term decline in the quality of riparian habitat would result in overall long-term declines for raptor populations associated with large woody riparian vegetation such as cottonwoods and aspens. In riparian habitats where large woody vegetation was never a part of the normal vegetation composition, raptor populations would not significantly change.



Many cottonwood riparian habitats consist of only scattered mature and overmature trees with no young trees being established. Habitat improvement without rest from grazing would be difficult to achieve. In some riparian habitats woody vegetation was a part of the presettlement condition but is now absent because of livestock grazing and other less widespread actions. These areas would not recover in the short term. Often more than 20 years would be needed to return them to cottonwood gallery forests, improving nesting and fledgling habitat for riparian-dependent raptors. These slow riparian habitat improvements would benefit species like the red-tailed hawk, Swainson's hawk, merlin, great-horned owl, common black-hawk, and sharp-shinned hawk.

### Resident and Anadromous Fish

Riparian improvements and fish habitat improvement projects would continue to be implemented on a small number of showcase or high-profile areas. But increased emphasis on livestock production would result in a greater emphasis on forage production. The current slightly upward trend in upland range condition would continue, resulting in slightly better water quality for fish. Downward trends in riparian condition would continue to degrade aquatic habitats.

Under Livestock Production, permittees would play major roles in making decisions about public rangelands and would be rewarded for meeting interdisciplinary resource objectives. This award system would result in some local improvements for aquatic habitat, but overall aquatic habitat would continue to decline as associated riparian conditions decline.

### Special Status Species

Under the Livestock Production alternative, special status and sensitive species would respond to changes in vegetation and mirror general trends exhibited by wildlife.

Range improvement projects would focus on livestock forage development on uplands. Habitats for riparian- and aquatic- dependent species would continue to decline. Upland species dependent upon livestock forage may follow a slight upward trend over the long term if exotic monocultures are not established.

Under Livestock Production, most appealed grazing decisions would not be immediately placed in full force and effect. Short-term delays in implementing decisions would result in the incidental "take" of species in limited areas where management changes are attempted to protect or increase special status species. "Take" is defined in the Endangered Species Act as follows: to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.

By expanding the roles of grazing advisory boards, the Livestock Production alternative would result in a slight trend away from promoting restoration and recovery of habitat requirements for special status species.

### Wild Horses and Burros

Improvement in upland vegetation conditions under the Livestock Production alternative would increase the amount and quality of wild horse and burro forage. But grazing advisory boards, with a bias toward livestock production, would influence the allocation of more forage toward livestock rather than wild horses and burros. Advisory board influence would lead to litigation by those who believe they have not been suitably involved or heard.

Under Livestock Production, more range improvements, mainly privately owned water developments and water rights, some land treatments, and fences, would be developed to increase livestock production. The new water developments could benefit wild horses and burros as water sources, but fences could constrain wild horse and burro movement and reduce social interaction among bands.

### Recreation

Livestock grazing under Livestock Production would affect recreation user experiences much as would Current Management, but the more range improvements under Livestock Production would further degrade the quality of user experiences. Expected increases in fencing would interfere with all types of cross-country travel, including travel for fishing and hunting.

Livestock Production's effects on developed and undeveloped recreation sites would be similar to the Current Management's. But the greater influence of grazing advisory boards under Live-



stock Production would constrain opportunities to expand developed sites more than would Current Management.

Scenic values would be more impaired under Livestock Production than under Current Management because of Livestock Production's increased emphasis on range improvements and vegetation manipulation projects for livestock grazing.

Opportunities for guides, outfitters, and single events would decrease more under Livestock Production than under Current Management because of increased impacts to sites, scenic values, and user experiences. More range projects, especially fences, would further complicate the planning and execution of events involving cross-country travel. More pastures and more intensive livestock use would also conflict more with cross-country events.

## Wilderness

The Livestock Production alternative would affect wilderness values the same as would Current Management. In the short term, new projects would not be developed in areas with wilderness values. But in the long term wilderness study areas not designated wilderness by Congress would be subject to loss of wilderness values by new range projects.

## Cultural and Paleontological Resources

An increase in livestock management facilities and major revegetation projects under the Livestock Production alternative would cause ground disturbance, potentially damaging cultural resources. Adverse impacts to cultural resource would be minimized through project clearances.

## Economic Conditions

Under the Livestock Production alternative, increased emphasis on producing livestock forage would slightly slow the decline in the livestock subsector of the agriculture industry. (These trends are discussed in Chapter 3.) But ongoing trends in the industry would continue. These trends are described below.

Population growth and demographic changes in the West and in many western rural communities would continue to transform rural economies. Population growth in many rural communities, while contributing to economic growth and diversification, will continue to diminish the relative importance of agriculture in those communities. Economic diversification, however, also offers more opportunities to earn off-ranch income and helps families maintain their ranch operations. Communities that continue to lose population and whose economies are in decline may be further strained by decreases in livestock production.

Land use changes could affect community tax bases. The impact to a local economy of a change in livestock production depends on the relative size and growth trends in other sectors of that economy. Where a relatively significant livestock industry declines, tax revenues have a high probability of declining. On the other hand, where other sectors of the economy are stable or growing and a relatively small decline occurs within a large livestock industry (or a large decline occurs within a small livestock industry), major impacts to the tax base are unlikely.

Changes in land use may accelerate the decline in public access to public lands where access depends on crossing private lands. Reduced access may increase the demand for land adjustment (such as land exchanges or easement acquisition) by BLM and the Forest Service to obtain more access to public lands.

Policies aimed at recovery of endangered species, such as desert tortoises, anadromous fish, and grey wolves, would continue to restrict livestock grazing in endangered species habitat. On the other hand, future activities designed to avert habitat loss and endangered species listings may help sustain livestock production in the long term.

Eliminating the Federal Government's wool subsidy program over the next 3 years could accelerate the decline in sheep production in the West and may cause marginal sheep producers to sell their operations. Other government policies, such as trade agreements aimed at reducing international trade barriers, will also continue to affect the industry. Agreements of this kind may both increase and decrease livestock production, but the direction and magnitude of these impacts is beyond the scope of this EIS.



The expiration of Conservation Reserve Program contracts beginning in 1996 might encourage the use of croplands for pasture, thereby increasing forage for livestock.

The most important direct and indirect economic effects that would result from implementing the Livestock Production alternative are discussed in the following sections.

## Regional Economic Impacts

Effects of the Livestock Production alternative on employment and income would stem from two sources: a reduction in federal forage for livestock use and an increase in grazing fees charged for the remaining federal forage. Appendix N, MicroIMPLAN System and Methodology for Estimating Impacts to Employment and Income, describes the methodology used to assess the economic impacts.

Under the Livestock Production alternative, forage would decline by 3 percent overall after 5 years of implementation and by 12 percent overall after 20 years. For Current Management, available forage will decline by 5 percent in 5 years and 20 percent in 20 years (18 percent for BLM and 19 percent for the Forest Service). In comparison, the Livestock Production Alternative would provide 2 percent more AUMs available in the short term (5 years) and 8 percent more in the long term (20 years).

The Livestock Production alternative would result in the smallest decline of federal forage of all alternatives over both the short and long term because of the increased management emphasis on producing livestock forage. The for-

age declines projected under Livestock Production would mainly result from continuing historic trends (reflected in Current Management) that would not be reversed even when managing for livestock forage. Table 4-7 shows the employment and income effects of the decline in forage under Livestock Production across all fee levels.

After 5 years, employment is estimated to decline by a range of 470 to 1,610 jobs (about 0.03 percent of total westwide agricultural employment under the current PRIA fee alternative 1, or 0.1 percent under regional fees and competitive bidding fee alternatives 4 and 7, respectively). Under the BLM-Forest Service proposed fee formula (fee alternative 3), the decline is estimated to amount to be between 880 and 1,010 jobs or 0.07 percent of total westwide agricultural employment<sup>5</sup>.

After 20 years, employment is estimated to decline by a range of 1,700 (PRIA fee) to 2,730 jobs (regional fees and competitive bidding). Under the BLM-Forest Service proposed fee formula, the decline would be between 2,066 and 2,180 jobs. The 20-year declines across all fee levels would be from 0.1 to 0.2 percent of total agricultural employment westwide.

Total income after 5 years is estimated to decline by a range of \$19.1 to \$61.1 million.

<sup>5</sup> The impacts for the BLM/Forest Service Proposed Fee are presented as a range between those caused by a \$4.28 fee and those caused by a \$3.72 fee. See **Assumptions and Analysis Guidelines** for more information.

**Table 4-7:** Decreases in Employment and Income 5 and 20 Years after Implementing the Livestock Production Alternative

	Fee Level						
	PRIA (Current)	Modified PRIA	BLM/FS Proposed	Regional	FFF	PRIA with Surcharge	Competitive Bidding
Decreased Employment							
After 5 Years	471	874	1,005	1,606	576	880	1,606
After 20 Years	1,697	2,062	2,182	2,727	1,792	2,068	2,727
Decreased Income (1993 \$)							
After 5 Years (\$000)	\$19,058	\$33,961	\$38,860	\$61,142	\$22,934	\$34,211	\$ 61,142
After 20 Years (\$000)	\$68,513	\$82,034	\$86,477	\$106,692	\$72,029	\$82,260	\$106,692



(Under the current PRIA fee about 0.06 percent of total agricultural income westwide; under regional fees and competitive bidding about 0.2 percent.) Under the BLM-Forest Service proposed fee formula, the decline is estimated to be between \$34.2 million and \$38.9 million (about 0.1 percent) (See Figure 4-15a).

After 20 years, total income is estimated to decline by a range of \$68.5 to \$106.7 million. (Under the current PRIA fee about 0.2 percent; under regional fees and competitive bidding about 0.3 percent.) Under the BLM-Forest Service proposed fee formula, the decline is estimated to be between \$82.3 million and \$86.5 million (less than 0.3 percent of total agricultural income westwide) (See Figure 4-15a). (Table 3 in Appendix P, Changes in Employment and Income after 5 Years and 20 Years of Implementation under Different Fee Levels, contains more detailed information on employment and income impacts.)

Employment and income impacts would be smaller under the Livestock Production alternative than under any other management alterna-

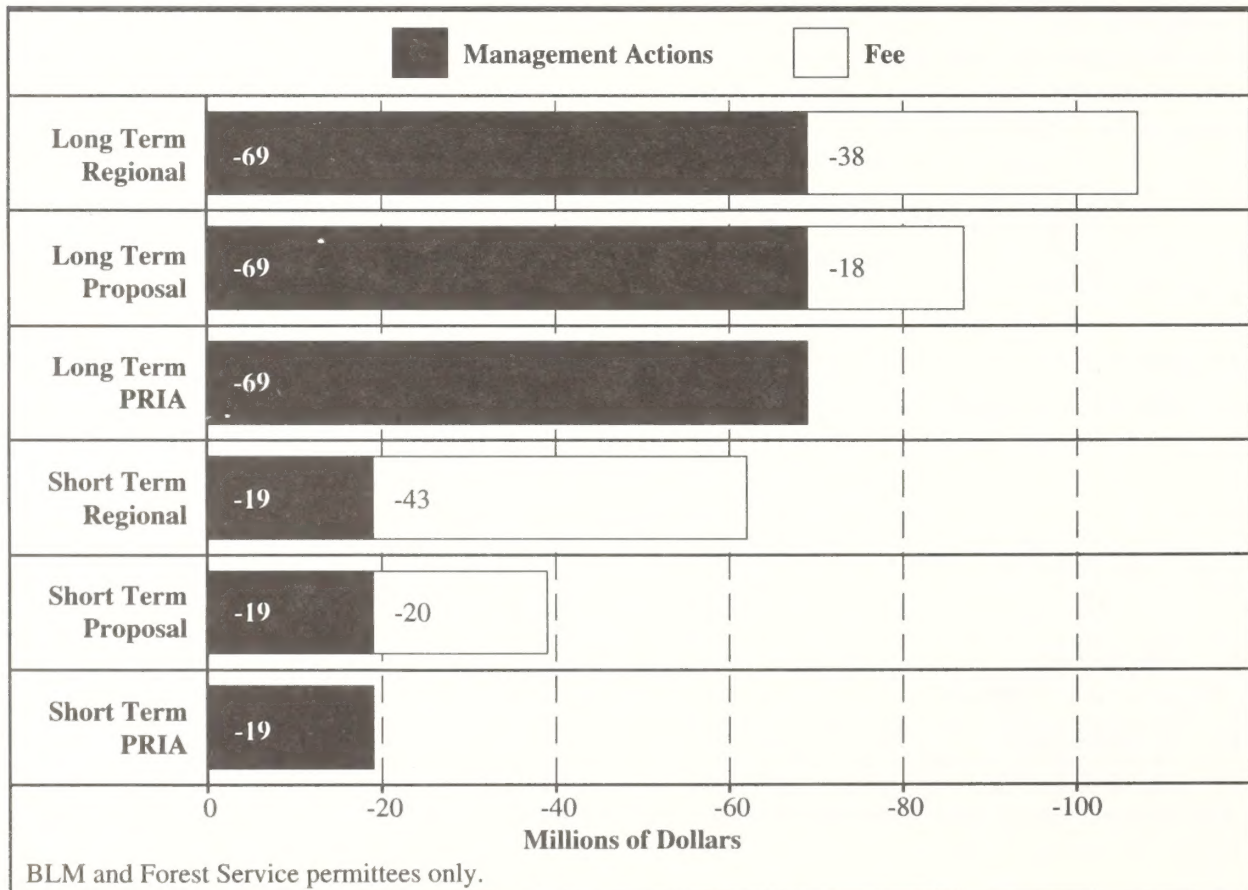
tive. Further, the impacts would be slight compared to current conditions and trends in the westwide economy as a whole, and in the agriculture sector in particular. The impacts would occur in the context of an economy that has consistently grown over the past 10 years and is expected to continue growing.

Thus, continued growth in employment and income in other sectors would tend to offset the relatively small employment and income declines from reduced forage.

On a more local level, the impacts could be proportionately smaller or greater, but the location and intensity of impacts are difficult to estimate. In the Columbia Basin analysis area, land treatments would result in slight long-term increase in BLM forage, slightly benefiting employment and income in that area.

The impacts from reduced forage westwide, however, do not consider other factors that could mitigate the overall impacts. For example, declines in employment and income from forage reductions do not consider adjustment periods for phasing in a higher grazing fee over a 3-year

Figure 4-15a: Reductions in Income, Livestock Industry, Livestock Production Alternative





period or longer. Phasing in a higher fee would reduce the short-term impacts. Nor do these impacts account for the economy's ability to absorb gradual changes in forage over time (i.e., 12 percent over 20 years) as opposed to a sudden 12 percent decline in forage in 1 year.

The short- and long-term rates of decline in employment and income under Livestock Production would be slower than the rates of decline under Current Management, but the rates of decline would not be reversed. Increased emphasis on livestock forage production would not reverse ongoing trends in agriculture or the westwide economy, except possibly in the Columbia Basin analysis area.

Overall deterioration of resource conditions, such as wildlife habitat and watersheds, would reduce wildlife-related recreation and recreation opportunities in general. This damage in turn, could lower income and employment in recreation-related economic activity. These impacts would be in addition to employment and income losses from forage reductions and higher grazing fees.

## Ranch Income and Operation Impacts

This section describes the impacts to ranches and ranch income resulting from changes in federal forage for livestock grazing, increases in grazing fees, and regulation changes that would potentially affect permittee operations. Impacts are described for three hypothetical herd sizes: 425 cows, 210 cows, and 90 cows. Impacts are also considered for two levels of federal forage dependency for each of these three operations: 60 percent and 30 percent. Appendix O, Changes in Ranch Returns from Reduced AUMs and Higher Grazing Fees, describes the methodology used to assess the impacts to ranch operations.

Under the Livestock Production alternative, federal forage would decrease by 3 percent after 5 years and by 12 percent over 20 years. The Livestock Production alternative would result in the lowest decline in forage of all alternatives over the short and long term because of the increased management emphasis on producing forage for livestock. The forage declines projected for Livestock Production would mainly result from continuing historic trends that would not be reversed even when managing for

livestock forage. These figures are a westwide average and do not necessarily represent the forage reductions estimated for all ranches.

Table 4-8 shows estimated losses in net cash returns (cash receipts minus expenses) to the six hypothetical operations over the short and long term as a result of reduced forage. These impacts are shown for the current PRIA fee level (\$1.86), the BLM-Forest Service proposed formula (\$3.96)<sup>6</sup>, and the weighted average regional fee level (\$6.38).

In this analysis, the impact would be greatest for a herd size of 425 cows and a 60 percent dependency on federal forage. In the short term, a 3 percent reduction in forage at the current fee level would decrease net cash returns by \$700. At \$3.96/AUM, net cash returns would decline by \$7,900 in the short term. And, at \$6.38/AUM, net cash returns would decline by \$14,000 in the short term.

In the long term, a 12 percent reduction in forage at the current fee level would decrease net cash returns by \$2,700. At \$3.96/AUM, net cash returns would decline by \$9,300 in the long term. And at \$6.38/AUM, net cash returns would decline by \$14,900 in the long term.

This ranch, with a herd size of 425 and 60 percent dependency on federal forage, is assumed to now use 3,060 AUMs of forage (425 \* 12 months \* 0.6). After 5 years, the operation would use 2,900 AUMs, and after 20 years would use 2,450 AUMs. Although the income impacts might be significant for this ranch and other ranches using a large amount of federal forage, only 8 percent of BLM permits and about 4 percent of Forest Service permits allow the use of more than 2,000 AUMs. Seventy-five percent of BLM permits and more than 50 percent of Forest Service permits allow no more than 500 AUMs.

The 90-cow operation with a 60 percent federal forage dependency described here is most closely associated with the permit size category of 500 or fewer AUMs. This operation is assumed now to have 650 AUMs (90 \* 12 months \* 0.6). The 210-cow ranch with 30 percent dependency and 760 AUMs is also representative of this permit size category.

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<sup>6</sup> The analysis for the BLM/Forest Service Proposal is actually based on a \$4.28 fee. \$4.28 is the value that would be produced with a FVI of 1.08. See **Assumptions and Analysis Guidelines** for more information.





**Table 4-8: Impacts to Ranch Operations under the Livestock Production Alternative**

Alternative 3: Livestock Production	Ranch Attributes			Herd Impacts	Net Cash Returns Lost		
	Herd Size	Percent Dependency on Federal Forage	Percent AUM Reduction	# of Cows Lost per Permitted Herd	Due to Smaller Herd Size <sup>1</sup>	At \$3.96/ AUM <sup>2</sup>	At \$6.38/ AUM <sup>3</sup>
<b>Year 5</b>	425	60.0	3.0	7.9	\$679	\$7,862	\$14,095
	425	30.0	3.0	4.0	344	3,936	7,052
	210	60.0	3.0	3.9	335	3,884	6,964
	210	30.0	3.0	2.0	172	1,947	3,487
	90	60.0	3.0	0.6	52	1,573	2,893
	90	30.0	3.0	0.3	26	787	1,447
<b>Year 20</b>	425	60.0	12.0	31.8	2,735	9,252	14,906
	425	30.0	12.0	15.9	1,367	4,625	7,453
	210	60.0	12.0	15.7	1,350	4,570	7,364
	210	30.0	12.0	7.9	679	2,289	3,686
	90	60.0	12.0	2.4	206	1,586	2,783
	90	30.0	12.0	1.2	103	793	1,392

<sup>1</sup> Net cash returns lost at current fee level.

<sup>2</sup> Net cash returns lost due to herd size reductions plus increased fee (to \$4.28/AUM) on remaining federal forage. This analysis for the BLM/Forest Service Proposal of \$3.96 is based on a \$4.28 fee. \$4.28 is the value that would be produced with a FVI of 1.08 instead of an FVI of 1 as proposed. See **Assumptions and Analysis Guidelines** for more information. The impacts presented here are overstated by 3 to 12 percent, depending on the management alternative.

<sup>3</sup> Net cash returns lost due to herd size reductions plus increased fee (to \$6.38/AUM) on remaining federal forage. \$6.38/AUM is the average value of the regional fees (weighted by the number of AUMs in each state charged at each fee level).

Although the main adjustment permittees would make to reduced forage would be to decrease their herd sizes, permittees could respond in other ways: substituting other forage (leasing more private pasture), using supplemental feed (hay), increasing the productivity of private lands (pushing ditches further up the sideslopes or installing wells and center pivot sprinkler systems to increase vegetation on private property), or encouraging federal agencies and state game officials to install wildlife bait stations to keep elk and deer in the uplands to reduce competition for forage. These responses would somewhat offset losses of federal forage.

Reductions in federal forage would most affect permittees that depend most on federal forage to meet their total feed requirements.

Impacts of forage reductions would vary with the financial condition of the ranch. Unprofitable ranches would be further stressed by reductions in federal forage and higher grazing fees. The more profitable an operation, the better it would deal with higher fees and reduced access to federal forage.

The effects of reduced federal forage and higher grazing fees would also depend on a ranch's flexibility in finding and purchasing alternative forage sources. Ranches with the fewest alternatives and least flexibility would reduce livestock the most in response to higher fees and less forage. Even ranches that do not greatly depend on federal forage could be stressed by reductions if they cannot find affordable alternative forage.



The impacts of reduced federal forage and higher grazing fees would be somewhat lessened by phasing in grazing fee increases over a 3-year or longer period. Additionally, gradual reductions in federal forage over the long term would also allow permittees to adjust their operations. Other potential mitigating measures that would lessen impacts would be a two-tiered grazing fee system in which small family ranches might pay lower fees than larger commercial operations, or an incentive-based fee system in which permittees would be given incentives (financial or otherwise) for good stewardship. Increases in Range Betterment Funds resulting from higher grazing fees might also help mitigate losses to ranches by funding more improvements that benefit livestock. Granting permit tenure for up to 20 years might benefit permittees, encouraging them to invest in more range improvements on federal lands.

### Grazing Fee Receipt and Payment Impacts

Table 4-9 shows changes in grazing fee receipts under the Livestock Production alternative at all fee levels. Grazing fee receipts would decrease less under Livestock Production than under the other management alternatives because of the slower decline in federal forage.

Under all other fee levels, grazing fee receipts would increase over current conditions. Increases under Livestock Production would be greater than under the other management alternatives because of Livestock Production's slower decline in federal forage.

The federal forage fee (alternative 5) would generate the lowest increases: \$7.1 million in 5 years (23 percent) and \$3.6 in 20 years (12 percent). Under the current PRIA fee, receipts would decline by 3 percent over 5 years (\$923,000) and by 12 percent over 20 years (\$3.7 million). The regional fees (alternative 4) would generate the greatest increases over time: \$71.6 million in 5 years (233 percent) and \$62.1 million in 20 years (202 percent).

The BLM-Forest Service proposed fee formula (alternative 3) would generate increases between these two extremes: \$37.9 million in 5 years (123 percent, more than double the current estimated level of receipts of \$30.8 million) and \$31.5 million in 20 years (102 percent).

Table 4-9 shows the distribution of receipts to Range Betterment Funds, payments to states and counties, and revenues to the U.S. Treasury. Assuming that the distribution of grazing fee receipts would remain the same, these three categories would show the same percentage changes. Table 4-9 also shows grazing fee receipts separately for BLM and the Forest Service.

Also see Table 3, Livestock Production alternative, in Appendix Q, Total Grazing Fee Receipts After 5 Years and 20 Years Under Different Fee Alternatives, for total grazing fee receipts at all fee levels.

## Social Conditions

### Permittees

In the short term under the Livestock Production alternative, the losses in income experienced by the average permittee (with a herd size of 210 cows and a 30 percent dependency rate) would be \$172 annually at the current fee level, \$1,947 at \$3.96/AUM, and \$3,487 at \$6.38/AUM. In the long term, the losses for the same average permittee would be \$679 annually at the current fee level, \$2,289 at \$3.96/AUM, and \$3,686 at \$6.38/AUM. The size of the loss for any permittee would depend on the size of the operation, the dependency on federal forage, the amount of forage lost, and the grazing fee. The effect of the loss on any individual permittee would vary depending on the size of the loss, the financial condition of the ranch and the dependence of the ranch family on the operation.

Losses in ranch income could result in declines in the economic well-being of some permittees and their families. Lifestyle changes in response to the income loss could include families decreasing their spending, diversification of the operation to make it less dependent upon ranching, and sending family members to work off the ranch to bring in more income. Most permittees would try to adjust their operations to absorb income losses rather than sell their ranches because maintaining the ranching lifestyle is important to them.

Under Livestock Production, losses in income would be less than under Current Management. Permittees would have time to adjust to the long-term declines in forage. At the higher fee levels, however, losses would be higher than permittees are now experiencing. Implement-



**Table 4-9: Livestock Production Alternative: Change in Grazing Fee Receipts (over current) after 5 Years and 20 Years under Different Fee Alternatives**  
(Millions of 1993 \$)

	Current	Current PRIA Fee		Modified PRIA Fee		Proposed Action Fee		Regional Fees and Competitive Bidding		Federal Forage Fee		PRIA with Surcharge	
		5 Years	20 Years	5 Years	20 Years	5 Years	20 Years	5 Years	20 Years	5 Years	20 Years	5 Years	20 Years
Range Betterment Fund (RBF)	\$15.39	\$14.93	\$13.54	\$29.62	\$26.87	\$34.35	\$31.16	\$51.20	\$46.45	\$18.94	\$17.19	\$29.85	\$27.08
BLM	\$9.47	\$9.18	\$8.33	\$18.22	\$16.53	\$21.13	\$19.17	\$31.49	\$28.57	\$11.65	\$10.57	\$18.36	\$16.66
USFS	\$5.92	\$5.75	\$5.21	\$11.40	\$10.34	\$13.22	\$11.99	\$19.71	\$17.88	\$7.29	\$6.62	\$11.49	\$10.43
Payments States/Countries	\$6.00	\$5.82	\$5.28	\$11.54	\$10.47	\$13.38	\$12.14	\$19.95	\$18.10	\$7.38	\$6.70	\$11.63	\$10.55
BLM	\$3.32	\$3.22	\$2.92	\$6.39	\$5.80	\$7.41	\$6.73	\$11.05	\$10.03	\$4.09	\$3.71	\$6.44	\$5.85
USFS	\$2.67	\$2.59	\$2.35	\$5.15	\$4.67	\$5.97	\$5.42	\$8.90	\$8.07	\$3.29	\$2.99	\$5.19	\$4.71
Receipts to Fed Treasury	\$9.39	\$9.11	\$8.27	\$18.08	\$16.40	\$20.96	\$19.02	\$31.25	\$28.35	\$11.56	\$10.49	\$18.22	\$16.53
BLM	\$6.14	\$5.96	\$5.41	\$11.82	\$10.73	\$13.71	\$12.44	\$20.44	\$18.54	\$7.56	\$6.86	\$11.92	\$10.81
USFS	\$3.25	\$3.15	\$2.86	\$6.25	\$5.67	\$7.25	\$6.58	\$10.81	\$9.81	\$4.00	\$3.63	\$6.30	\$5.72
Total	\$30.78	\$29.85	\$27.08	\$59.23	\$53.74	\$68.70	\$62.32	\$102.40	\$92.90	\$37.89	\$34.37	\$59.71	\$54.17
BLM	\$18.93	\$18.36	\$16.66	\$36.43	\$33.05	\$42.25	\$38.33	\$62.99	\$57.14	\$23.30	\$21.14	\$36.73	\$33.32
USFS	\$11.85	\$11.49	\$10.43	\$22.80	\$20.68	\$26.44	\$23.99	\$39.42	\$35.76	\$14.58	\$13.23	\$22.98	\$20.85
BLM	\$18.93	\$18.36	\$16.66	\$36.43	\$33.05	\$42.25	\$38.33	\$62.99	\$57.14	\$23.30	\$21.14	\$36.73	\$33.32
RBF	\$9.47	\$9.18	\$8.33	\$18.22	\$16.53	\$21.13	\$19.17	\$31.49	\$28.57	\$11.65	\$10.57	\$18.36	\$16.66
Payments States/Countries	\$3.32	\$3.22	\$2.92	\$6.39	\$5.80	\$7.41	\$6.73	\$11.05	\$10.03	\$4.09	\$3.71	\$6.44	\$5.85
Receipts to Fed Treasury	\$6.14	\$5.96	\$5.41	\$11.82	\$10.73	\$13.71	\$12.44	\$20.44	\$18.54	\$7.56	\$6.86	\$11.92	\$10.81
USFS	\$11.85	\$11.49	\$10.43	\$22.80	\$20.68	\$26.44	\$23.99	\$39.42	\$35.76	\$14.58	\$13.23	\$22.98	\$20.85
RBF	\$5.92	\$5.75	\$5.21	\$11.40	\$10.34	\$13.22	\$11.99	\$19.71	\$17.88	\$7.29	\$6.62	\$11.49	\$10.43
Payments States/Countries	\$2.67	\$2.59	\$2.35	\$5.15	\$4.67	\$5.97	\$5.42	\$8.90	\$8.07	\$3.29	\$2.99	\$5.19	\$4.71
Receipts to Fed Treasury	\$3.25	\$3.15	\$2.86	\$6.25	\$5.67	\$7.25	\$6.58	\$10.81	\$9.81	\$4.00	\$3.63	\$6.30	\$5.72



ing this alternative at the current fee level should somewhat reduce the existing economic stress of trying to maintain viable ranches.

The attitude of the ranching community and related businesses toward the Livestock Production alternative would be positive. Livestock Production was developed as a result of public input from the ranching community. Local grazing advisory boards would play a leading role in making decisions about federal rangelands, and the permittee and agency would work closely to implement objectives. This structure would let permittees feel somewhat more in control over the management of their ranches. The greater sense of control than would result from the other alternatives would reduce social stress.

The ranching community values hard work and fair play. From the permittee perspective, these values are built into the philosophy of the Livestock Production alternative through an incentive program. Ranches practicing sound rangeland management would be rewarded, and ranches practicing unsound rangeland management would be penalized. For ranches practicing sound rangeland management, this system would help maintain rancher feelings of self-sufficiency, independence, and control over one's destiny.

Groups and individuals that are highly concerned about rangeland conditions would disagree with the adoption of this alternative. The existing stressful relationships between these groups and ranchers would continue and possibly intensify.

## Counties and Communities

Westwide in the short term under the Livestock Production alternative, 470 jobs would be lost at the current fee level; between 880 and 1,010 jobs would be lost at \$3.96/AUM; and 1,610 jobs would be lost at \$6.38/AUM. In the long term under this alternative, 1,700 jobs would be lost at the current fee level, between 2,070 and 2,180 jobs at \$3.96/AUM and 2,730 jobs would be lost at \$6.38/AUM. These losses represent jobs in all sectors of the economy, in ranch employment as well as jobs that are directly and indirectly related to ranching. Fewer jobs would be lost than under Current Management, and job losses at all fee levels would be insignificant at the westwide level. Most of the projected

decline in employment should be absorbed through retirements and people seeking other types of work in the normal course of their lives.

For some communities like the "typical small community" described in Chapter 3, the Livestock Production alternative at the current fee level represents a slowing of the ongoing population loss. The potential effects of job and population loss on local communities are described in the Social Conditions discussion of the Impacts Common to All Alternatives section at the beginning of Chapter 4.

Grazing fees would increase the most in areas with a high average dependency on federal grazing, such as Gunnison County, Colorado. The effects of these fee increases would depend on the financial condition of local ranches and local economic conditions. In areas where there are few permittees, the community population is large and the economy is diverse, fee increases would be insignificant at the county and community levels.

Since permittees and other county residents would have time to adjust to the long-term declines in forage and because Livestock Production would allow more input from permittees, the social environments of communities such as Rawlins (Carbon County, Wyoming) would improve. In these areas, permittees and residents would agree with the livestock management emphasis of Livestock Production and support the increased responsibility given to advisory boards. Although the quality of recreation would decline in the long term, local recreationists and those promoting recreation as a way to diversify the local economy would favor Livestock Production because it would benefit local permittees and the community.

In others areas such as Gunnison County, local recreationists and environmentalists might feel that more should be done to protect recreation, riparian, and wildlife resources. These groups and individuals might feel a loss of control over public land management and thus a decline in their social well-being. In the short term, differences in opinions and values among community groups could result in less cooperation and support among groups within these communities. Continued cooperation of livestock interests with environmentalists, as demonstrated by the Gunnison County Stockgrowers' Association and the High Country Citizens' Alliance, would help maintain com-



munity cohesiveness and the social well-being of environmentalists.

## National Impacts

Impacts under the Livestock Production alternative would be similar to those under Current Management but greater in magnitude. Increasing numbers of people in the West and across the county believe that rangeland management should emphasize protecting rangeland resources rather than managing livestock. The Livestock Production alternative is inconsistent with these attitudes. People who disagree with the selection of the Livestock Production alternative might feel powerless toward and frustrated about government in general, BLM and the Forest Service, and the policymaking process.

Generally, recreationists and environmentalists would not support the Livestock Production alternative because of long-term declines in riparian and wildlife habitat and recreation opportunities, such as camping and fishing. The condition of these resources is important to these groups because they value these resources as potential recreation areas, and many appreciate just knowing these areas exist and will continue to exist in the future.

Increasing numbers of people across the county, including some ranchers who are not permittees, feel that livestock grazing fees should be increased. Leaving the grazing fee at its current level is inconsistent with these attitudes.

## Alternative 4: Environmental Enhancement

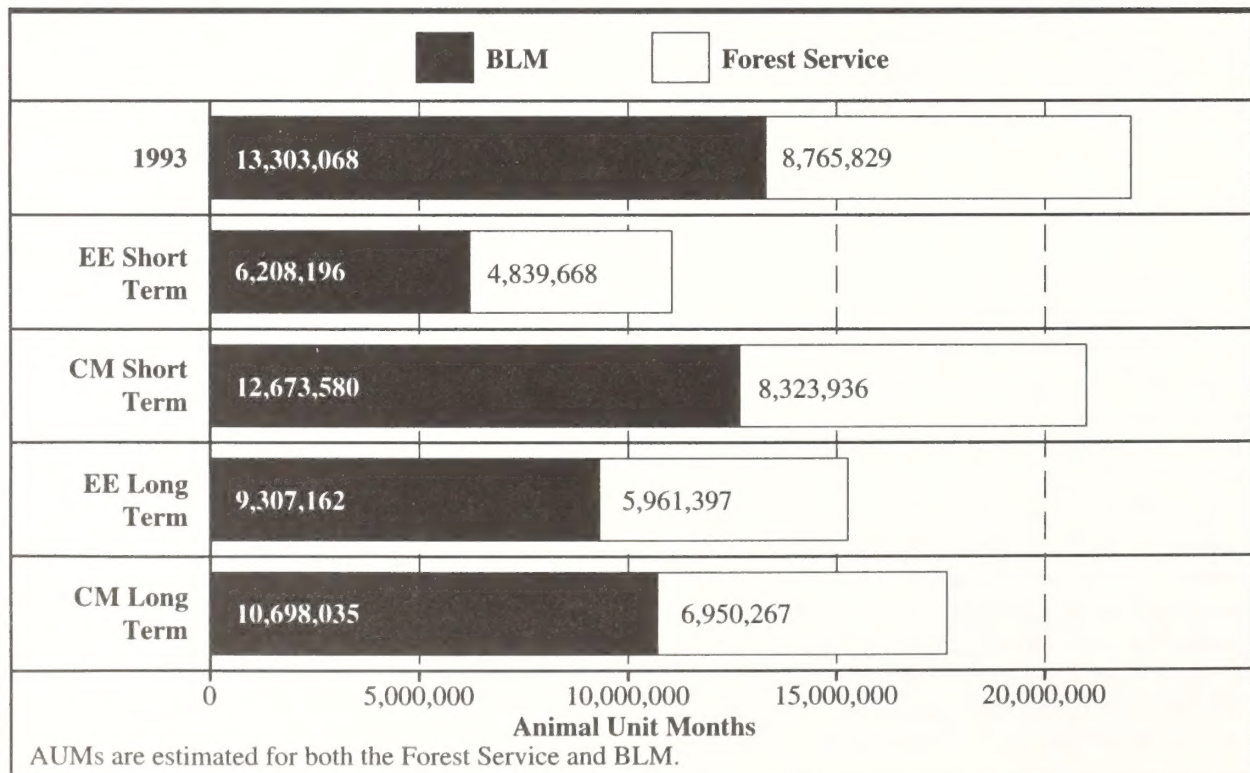
### Grazing Administration

#### Livestock Use Levels

Figure 4-16 shows potential short- and long-term levels of livestock use under the Environmental Enhancement alternative for both BLM and the Forest Service.

The trends shown in BLM and Forest Service national statistical reports (BLM 1992a; FS 1993a) and discussed for Current Management would continue under the Environmental Enhancement alternative. In the short term grazing use levels would decline by 53 percent on BLM-administered lands and by 45 percent on

**Figure 4-16:** Available Livestock Forage in Animal Unit Months, Environmental Enhancement Alternative





Forest Service-administered lands. But the long-term decline in authorized use from the current situation would amount to 30 percent for BLM-administered lands and 29 percent for Forest Service-administered lands. Short-term rates of change would differ between the two agencies because of differences in percentages of land classified as unsuitable for grazing.

Short-term declines in livestock grazing in the Columbia Basin analysis area would not be as significant as in the other areas because only 8 percent of Forest Service-administered lands would not meet or not be moving toward meeting forest plan objectives.

In the Coastal analysis area, removing livestock grazing from wilderness and areas of unknown status to meet forest plan objectives would result in 83 percent of the lands being ungrazed in the short term. As status information is obtained, some of these acres would again be returned to grazing.

## Program Efficiency and Effectiveness

BLM's workload would increase in the short term as it develops and implements regional standards and guidelines, including regional National Environmental Policy Act (NEPA) analyses. In the long-term, however, regional standards and guidelines would help focus BLM's management direction, promote biological diversity, and improve agency efficiency in meeting management objectives.

Changes in how both agencies handle public involvement and suitability (the proposed petition process) would also increase workloads and diminish program efficiency in the short term. By encouraging more people and organizations with a wider range of perceptions and interests to become intensively involved in grazing administration, the change in the level of public involvement would greatly increase the time needed to gain consensus on annual operating plans. Needed resource management decisions would be delayed, and the possibility of appeals on some decisions would increase. But more extensive and consistent public involvement would eventually help the agencies make decisions more reflective of (and acceptable to) a wider range of public interests, and thus might reduce appeals in the long term.

Under the Environmental Enhancement alternative, anyone could petition the Secretary of the Interior or Secretary of Agriculture to close or open areas to livestock grazing. The workload for both agencies would increase, particularly in the short term, depending on the number of petitions submitted. With budgets not expected to change much, the requirement to process the petitions through the Secretarial level within 8 months would take staff away from other important responsibilities. But in the long term, removing livestock grazing from unsuitable areas would decrease the number of permits processed and later regulatory actions.

Furthermore, changes in BLM grazing regulations and policies for base property leases and livestock pasturing agreements, unauthorized use, full force and effect decisions, long-term disqualification, multiple resource advisory boards, and range improvement ownership, would also improve BLM's efficiency and effectiveness in planning for and regulating grazing use. The Forest Service would also improve its ability to deter unauthorized use, and would reduce the number of grazing permits issued.

BLM would no longer need to administer base property leases (1,730 leases in 1993), which would be abolished under the Environmental Enhancement alternative. BLM and Forest Service base property administration would be consistent. Permittees would also be required to own the livestock they graze on federal land. By not having to administer livestock leases (834 in 1993), BLM employees would spend more time on other workload priorities, improving agency efficiency and effectiveness.

BLM and the Forest Service would also improve efficiency and reduce administrative workload by using the authority for nonmonetary settlements where unauthorized use is clearly incidental, only a slight amount of forage has been consumed, and natural resources are not affected.

Under the Environmental Enhancement alternative, by being able to effectively penalize violators, the Forest Service would improve its ability to control the small degree of repeated unauthorized grazing. In the long term, the Forest Service's ability to issue harsher penalties and deter repeated unauthorized use would result in an administrative workload more focused on cooperation.

Eliminating suspended nonuse might in the short term complicate BLM's negotiating of for-



age reductions. A few livestock operators believe that if AUMs are given suspended nonuse status, they would have the opportunity and priority for future reactivation. But in the long term, eliminating suspended nonuse would improve administrative efficiency by BLM's not having to administer the category. Forest Service regulations would not change.

By no longer allowing BLM decisions to automatically be stayed on appeal, the Environmental Enhancement alternative would allow most agency decisions to take effect within 75 days. A decrease in stayed agency decisions would speed up the implementing of AUM adjustments, prescribed management revisions, and other administrative changes resulting from standards and guidelines.

Not allowing permittees to immediately apply for a grazing permit after theirs have been canceled would help eliminate ineffective management and the need for continual adverse actions. Not allowing such permittees to hold a permit for up to 3 years might encourage better cooperation and result in improved resource management and cooperation between the agency and the permittee. Improved management would also reduce the regulatory workload associated with poor stewardship and improve the agencies' ability to implement prescribed management practices.

Including violations of other state and federal environmental laws in BLM's definition of prohibited acts would deter BLM permittees from violating state and federal laws and standards. Tracking state and federal violations would somewhat increase BLM's administrative workload, depending on the number of violators during the first 5 years. But whatever the number, it should decrease within the following 5 years as permittees become familiar with the regulations and understand the consequences of losing their permit for violations. The Forest Service's current regulations on violations have not been found to diminish administrative efficiency. The Environmental Enhancement alternative would make BLM and Forest Service prohibited act regulations consistent.

Both BLM and Forest Service workloads would decrease because the agencies would no longer need to process applications for increased sustained forage allocations. As a result, the agencies would increase their efficiency in completing other administrative duties.

Neither BLM nor Forest Service permittees would be assured of receiving 10-year permits. Their performance as acceptable land stewards (measured by their willingness to comply with permit stipulations and federal regulations) would help determine the length of tenure of their permits. This regulation change would strongly encourage permittees with poor performance records to cooperate and comply with federal regulations. Administrative duties would at first increase but would level out over the long term as on-the-ground management implementation improves.

Multiple resource advisory councils would offer a better balanced input to the decisionmaking processes of both agencies, resulting in more informed decisions. Administrative workloads would be reduced because of fewer appeals by those who perceive that the agency has not considered all pertinent information in making its decision.

Creating joint BLM-Forest Service multiple resource advisory councils would better enable the agencies to implement ecosystem management because of better communication between agencies and the public and a trend toward increasingly consistent regulations.

Federal Government title on future range improvements would make BLM's policy consistent with the Forest Service's and would at first discourage some BLM permittees from investing money on a cooperative basis in range improvement projects. But as the new policy becomes more accepted over time, long-term permittee investment should rise again, as happened to investments in Forest Service range betterment projects, where the Forest Service owns improvements.

Implementing ecosystem management might at first require BLM and Forest Service people to spend more time with livestock operators and other interested people and groups to coordinate policies and the processes for achieving ecosystem management. In the short term, implementing ecosystem management would increase workloads in developing agency initiatives and goals. A more holistic and interdisciplinary management approach, however, would become more efficient in the long term by equally addressing the needs of the environment and of public land users.

Furthermore, under the Environmental Enhancement alternative, BLM and Forest Service regulations would be consistent. This consis-



tenacy, combined with greater efficiency and effectiveness resulting from implementing standard and guidelines and other changes, would help both agencies implement ecosystem management.

## Availability and Use of Range Betterment Funds

The Range Betterment Funds going to BLM and the Forest Service under the Environmental Enhancement alternative would depend on the grazing fee formula selected for implementation. For example, if the current grazing fee formula is kept, Range Betterment Funds would decline by 30 percent (from a 3-year average of \$15.4 million per year to \$10.8 million per year) over the long term. This decrease would result from a projected decline in livestock grazing on federal lands and an accompanying decline in grazing fee receipts.

A 30 percent decline in Range Betterment Funds, coupled with rising range improvement costs, would generally mean that far fewer range improvements could be built in the future. While some range improvements would no longer be necessary, many others would continue to be needed to meet livestock management and other resource objectives. Furthermore, funding would continue to be needed to rebuild existing projects.

For example, by removing livestock from areas considered unsuitable, some interior or pasture fences and water developments built to better distribute livestock might no longer be needed. But many existing fences would continue to be needed to keep livestock from lands unsuitable for grazing. More livestock control would be needed where federal and private lands are intermingled and are now fenced together. And new fences and more water development for livestock grazing on public lands would be needed to implement new grazing systems for assuring proper management of suitable areas.

Alternative sources of funding, including increased permittee contributions, agency appropriations, and contributions from other sources, would become more important just to maintain the current level of management within suitable areas. Without such funding, some existing fences and water development for livestock grazing on public lands would eventually fall into disrepair, and livestock use would

become increasingly difficult to manage. Fewer allotment management plans would be implemented each year, and progress would be slowed in meeting resource objectives by changing grazing management. Riparian habitat and other resource conditions within suitable areas could be placed at risk. Eventually livestock use might have to be reduced even more than projected.

A decline in funding, however, would be somewhat offset by giving the agencies more flexibility to distribute funds to priority areas and more authority to use funds to meet resource management priorities.

Range Betterment Funds would increase by 61 percent (to \$24.8 million per year) under the proposed grazing fee formula or by 140 percent (to \$36.9 million per year) under regional fees. Such large increases in the funds would more than offset the rising costs of range improvements and would generally mean that more range improvements could be built, maintained, and rebuilt. Such increased funding would be coupled with more authority to use Range Betterment Funds to meet a wider range of objectives and more flexibility to distribute those funds to priority areas.

The result of higher funding levels over the long term would be a large increase in the agencies' abilities to monitor resource conditions and to implement and rebuild needed improvements. These improvements would be aimed at achieving more resource management objectives than are now possible. The need for alternative sources of funding would correspondingly decrease.

## Vegetation

The Environmental Enhancement alternative would focus on managing federally administered lands for sustainable ecosystems. On BLM-administered lands where ecosystems are nonfunctioning or functioning but susceptible to degradation, and Forest Service-administered lands not meeting plan objectives, livestock grazing would no longer be allowed until these areas meet plan objectives or return to proper functioning condition and are once again suitable for grazing.

Vegetation conditions such as cover, vigor, and desired species composition would improve because livestock grazing would be removed where it conflicts with other uses. Vegetation,



particularly riparian, would immediately respond where livestock are removed. Most projected changes in vegetation condition would be attributable to a few key elements of the Environmental Enhancement alternative: excluding livestock from areas not in proper functioning condition; applying regional standards and guidelines, which would ensure the meeting of ecosystem management objectives, including biodiversity; increasing the nonuse of livestock forage within suitable areas; changing full force and effect provisions; expanding the representation of interests on multiple resource advisory councils; and changing the way Range Betterment Funds are allocated and used.

Applied under the Environmental Enhancement alternative more than under any other alternative, nonuse would allow a greater opportunity for ecosystem improvement and would result in greater biodiversity. Permittees would request longer periods of nonuse that would increase the acreage receiving grazing rest. The benefits of nonuse would vary depending on the length of rest from grazing.

By allowing rangeland decisions to be implemented with fewer delays, the Environmental Enhancement alternative in the short term would benefit the resources involved in the decision. Faster implementation would prevent some upland vegetation ecosystems from quickly moving into a lower successional stage that would be difficult or even impossible to reverse.

A long-term trend toward increased consideration of biodiversity would result from management decisions being influenced by a broader range of interested people and groups and from the replacement of livestock interest-dominated grazing advisory boards by multiple resource advisory councils.

Under Environmental Enhancement, interest groups would be likely to petition for more sensitive areas for nonuse status. Areas closed to grazing through the petition process would not improve as rapidly as other areas excluded from grazing since, by definition, all grazed areas under this alternative would already be in proper functioning condition.

Allocating half of Range Betterment Funds by state priorities would lead to faster improvement of ecosystem health and biodiversity. This is the current Forest Service policy.

Using Range Betterment Funds for project planning and environmental analysis would

speed up the implementing of projects. Using these funds for monitoring would ensure that projects are effective and would improve future planning of similar projects. And using these funds them to meet all resource management objectives on federal rangelands would allow these funds to be spent for ecosystem management rather than mainly for livestock management. Ecosystem management would place more emphasis on biodiversity, ecosystem processes, water quality, soil productivity, and wildlife habitats, and less emphasis on livestock production.

## Upland

In the long term, about 69,373,000 acres (95 percent) of Forest Service uplands would either be meeting objectives or moving towards objectives (an increase of 18 percent from 1993); another 3,819,000 acres (5 percent) would not be meeting objectives (a decrease of 73 percent). (See Figure 4-17.)

In the short term, BLM uplands in proper functioning condition would increase by about 5 percent. Upland acres functioning but susceptible to degradation would decrease by about 5 percent. And upland acres in nonfunctioning condition would only slightly decrease.

In the long term, about 151 million acres (95 percent) of BLM uplands would be in proper functioning condition (an increase of about 65 percent). No BLM uplands would be functioning but susceptible to degradation. And about 8 million acres (5 percent) of BLM acres would be in nonfunctioning condition (a decrease of about 60 percent). (Figure 4-18 shows estimated changes to upland functioning condition.)

Upland vegetation condition would only slightly change in sensitive areas (wilderness, wilderness study areas, developed recreation sites, threatened and endangered species habitat, and areas of national and historic cultural significance), where livestock grazing does not now conflict with upland vegetation objectives.

## Sagebrush

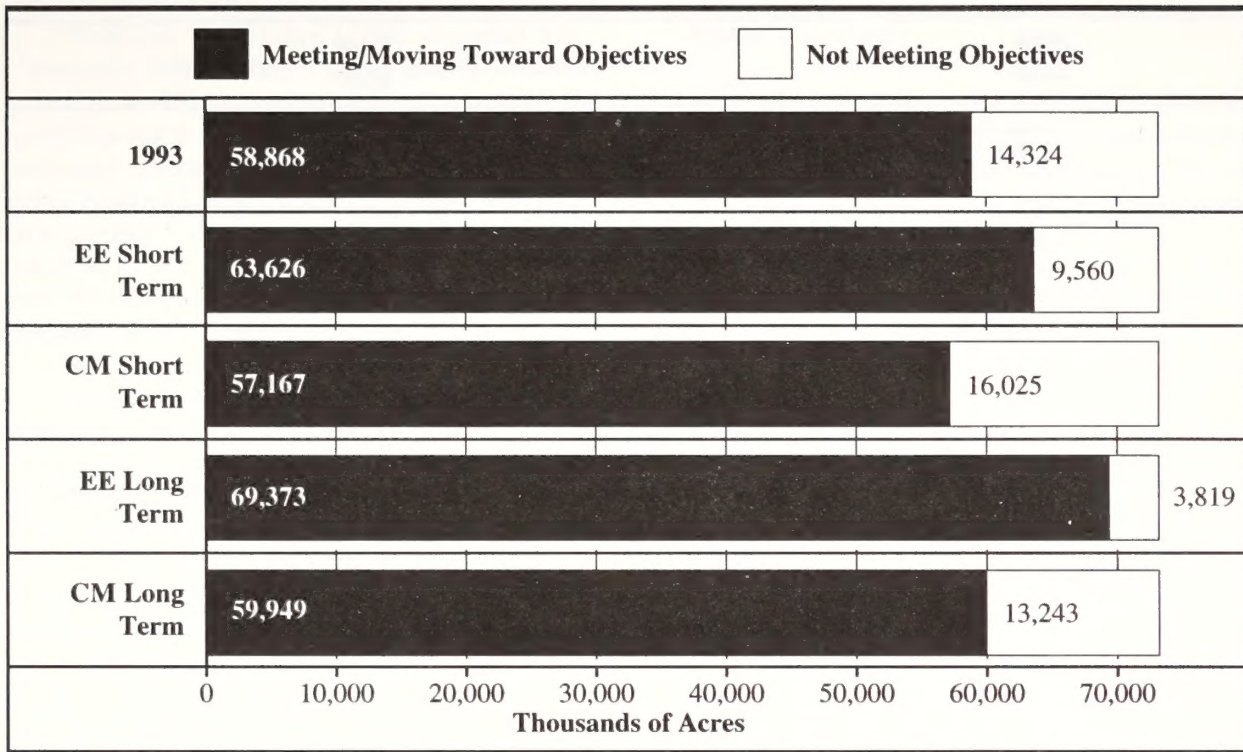
Under the Environmental Enhancement alternative, vegetation diversity, condition, and trend of sagebrush communities would improve in the higher precipitation zones.

Removing livestock grazing from sensitive areas and revegetating portions of nonfunctioning





**Figure 4-17: Change in Status - Forest Service Uplands, Environmental Enhancement Alternative**



acres with native diverse seed mixtures would benefit sagebrush communities. The percent composition of plants would resemble the late seral ecological stage in some but not necessarily all areas because lands would be managed on an ecosystem basis, and other seral stages would be needed for overall ecosystem health.

Sagebrush in the lower precipitation zones would not significantly improve except for nonfunctioning areas receiving vegetation treatments. These areas would be seeded with native, diverse plant species.

**Desert Shrub**

Removing livestock from the desert shrub vegetation communities would increase plant species vigor. But overgrazed desert vegetation recovers slowly. Both direct and indirect physical impacts often change the composition of plant communities, such as a community dominated by one shrub and annual plants. Under such dominance, the plant community cannot provide biodiversity, and the time needed to improve this condition would exceed 80 years. Revegetation is a slow process, which cannot be

induced in areas of low precipitation and high salinity. The response would therefore be slow, taking many years to achieve functioning condition.

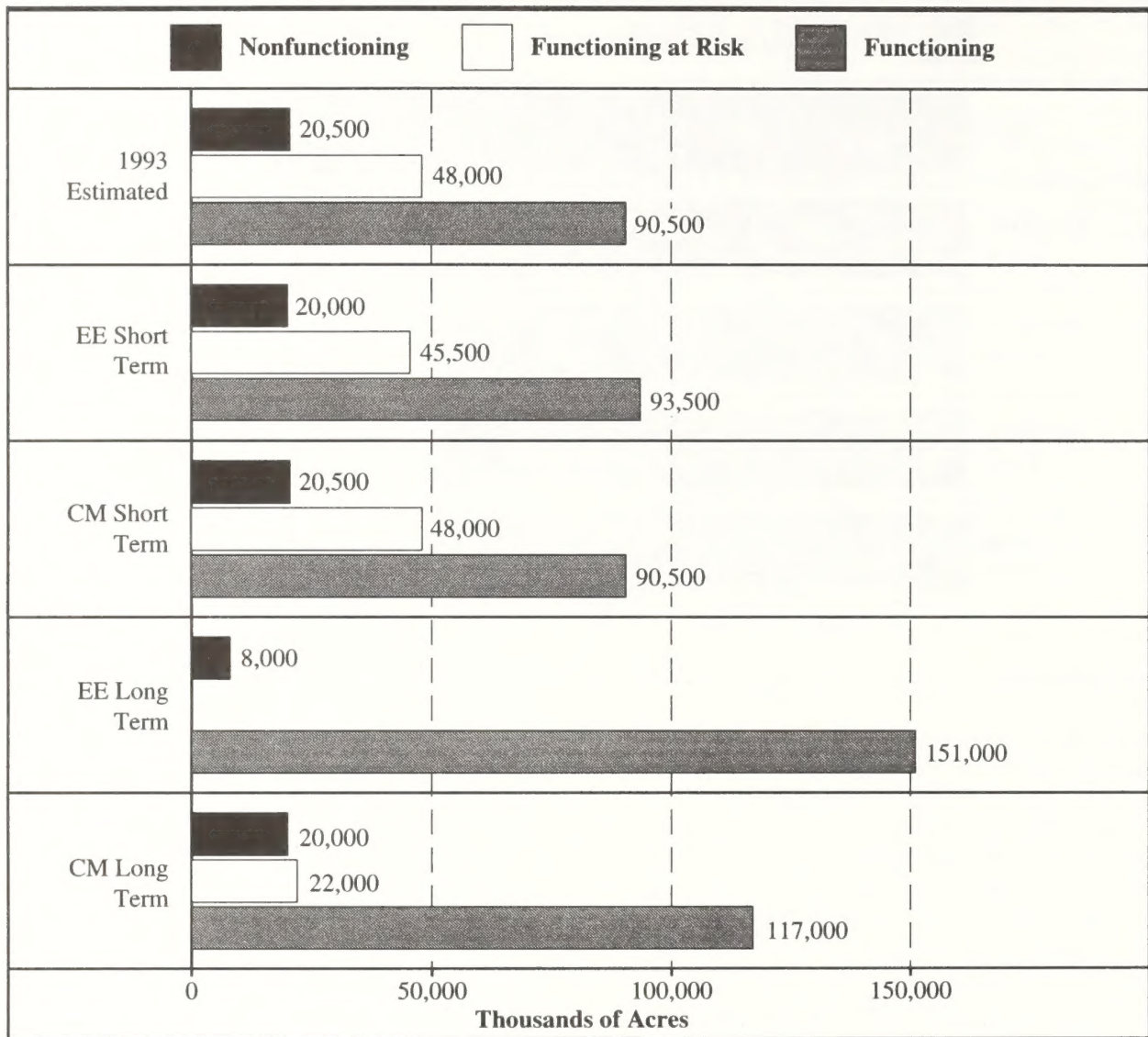
**Southwest Shrubsteppe**

The trend of increasing ground cover of grasses is expected to continue under the Environmental Enhancement alternative. Although the general trend would be to increase the grass cover, the response would vary depending on site characteristics and weather patterns. Sites with harsh growing conditions would not improve much in 20 to 30 years. Many sites now dominated by shrubs would continue to be dominated by them unless the shrubs are chemically or mechanically controlled. Although current management appears to have favored the grass component of the community, in some cases the shrub component may increase over the next 20 years. Shrubs appear to increase independently of grazing management if grazing is moderate (Holechek and others 1989).





**Figure 4-18: Changes in Functioning Condition - BLM Uplands, Environmental Enhancement Alternative**



***Chaparral-Mountain Shrub***

Removing livestock from a nonfunctioning mountain shrub community would increase the vigor of the areas's vegetation community. In the long term, some of the shrub community would tend toward stagnation (Holechek and others 1989), and the density of herbaceous perennials would slowly increase. The longevity of some shrubs such as Gambel oak approaches 4,000 years (West and Tueller 1972), enabling the shrub community to persist and compete on a given site. Removal of livestock alone would not end or reverse a change that such pressures had induced (Holmgren and Hutchings 1972).

The mountain shrub ecosystem may take a long time to recover. Within 2 to 5 years the following would increase: palatable species of grasses and forbs, height and density of existing grasses, residual vegetation matter carried over the winter, and litter and fine organic matter at the soil surface. Over the long term, seedlings and young palatable shrubs would increase.

***Pinyon-Juniper***

Removing livestock grazing from nonfunctioning pinyon-juniper ecosystems would allow the grass and shrub component of the ecosystem to increase in vigor where the pin-



yon-juniper canopy is not closed. Livestock removal would also reduce the disturbance of cryptobiotic crusts.

Holechek and others (1989) reported that "Recovery from overgrazing is nonexistent in most areas without control of the trees." Only practices such as prescribed fire and mechanical and chemical treatment would allow biodiversity to return (Doughty 1986). The pinyon-juniper ecosystem may take a long time to recover.

### ***Mountain and Plateau Grasslands***

Under the Environmental Enhancement alternative, mountain grasslands would experience relatively rapid increases in native bunchgrasses, decreases in shrubs and forbs, and a decrease in the rate of spread of medusahead and similar grasses. The speed of these changes would result from this vegetation type's growing in areas with 12 inches or more annual precipitation.

### ***Plains Grasslands***

The Environmental Enhancement alternative would remove livestock grazing from erodible landscapes where grazing is accelerating erosion and would allow livestock to return only when the ecosystems achieve functioning condition. This removal would speed up the rate of improvement in trend and ecological status. In addition, livestock would be excluded from all designated wilderness and wilderness study areas recommended as suitable for wilderness. As a result, the following vegetation traits would increase: palatable species of grasses and forbs, height and density of existing grasses, residual vegetation matter carried over the winter, and litter and fine organic material at the soil surface.

### ***Annual Grasslands***

In the short term under Environmental Enhancement the following annual grassland vegetation traits would increase if precipitation and other climatic variables are favorable: annual grasses and forbs, residual vegetation matter carried over the winter, litter and fine organic material at the soil surface, and standing plant matter after grazing. These changes could occur rela-

tively rapidly because annual grasslands respond annually to changes.

### ***Alpine Grasslands***

Many alpine ecosystems would be affected directly under the Environmental Enhancement alternative because a large percentage of the alpine areas are either wilderness or wilderness study areas. Removing livestock from alpine ecosystems would increase the vigor of upland vegetation in overgrazed areas. But because of cold temperatures and short growing seasons, these ecosystems would only slowly recover from overgrazing.

### ***Coniferous and Deciduous Forests***

The Environmental Enhancement alternative would increase the abundance, density, and vigor of palatable plants, especially understory forbs, ferns, grasses such as fescues and bluegrasses, and shrubs such as bitterbrush and currants. Changes would be most evident in open stands of pine and less noticeable in fir and redwood types. Overall changes would strongly depend on how fire and timber are managed. Tree reproduction in rested forests would slightly increase. Seedling and sapling age classes would also increase over time.

### ***Riparian/Wetland/Aquatic***

Riparian and upland impacts would differ because the productive potential of riparian areas would allow them to improve faster than uplands.

In the long term, 2,191,259 acres (100 percent) of Forest Service riparian areas would either be meeting objectives or moving towards objectives (an increase of 28 percent from 1993).

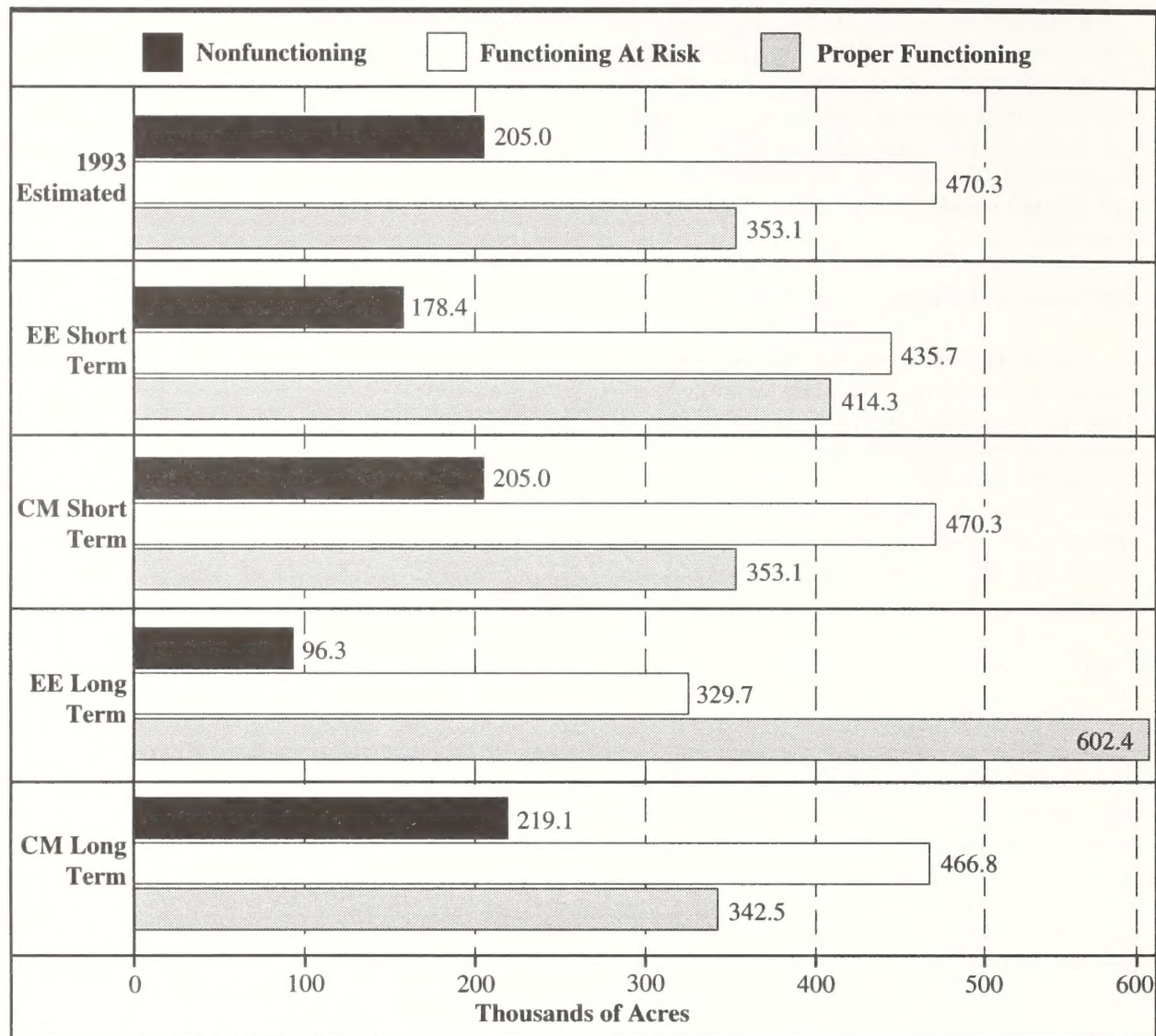
In the long term, 602,400 acres (about 59 percent) of BLM riparian areas would be properly functioning (an increase of 71 percent from 1993). Another 329,700 acres (32 percent) would become functioning but susceptible to degradation (a decrease of 30 percent from 1993). About 96,300 acres (9 percent) would be nonfunctioning (a decrease of 53 percent from 1993).

The Environmental Enhancement alternative would focus on managing federal lands for sustainable ecosystems. Livestock would be re-





**Figure 4-19: Changes in Functioning Condition - BLM Riparian, Environmental Enhancement Alternative**



4-92

moved from 1.3 million acres of riparian areas of unknown condition, from BLM-administered lands whose ecosystems are nonfunctioning or functioning but susceptible to degradation, and from Forest Service-administered lands not meeting plan objectives. Livestock grazing would no longer be allowed until these areas meet plan objectives or return to proper functioning condition and are once again suitable for grazing.

With the removal of livestock from most riparian areas, riparian and wetland condition would improve rapidly and improve watershed stability. (See Figures 4-19 and 4-20.) Short-term improvements would be dramatic. Long-term

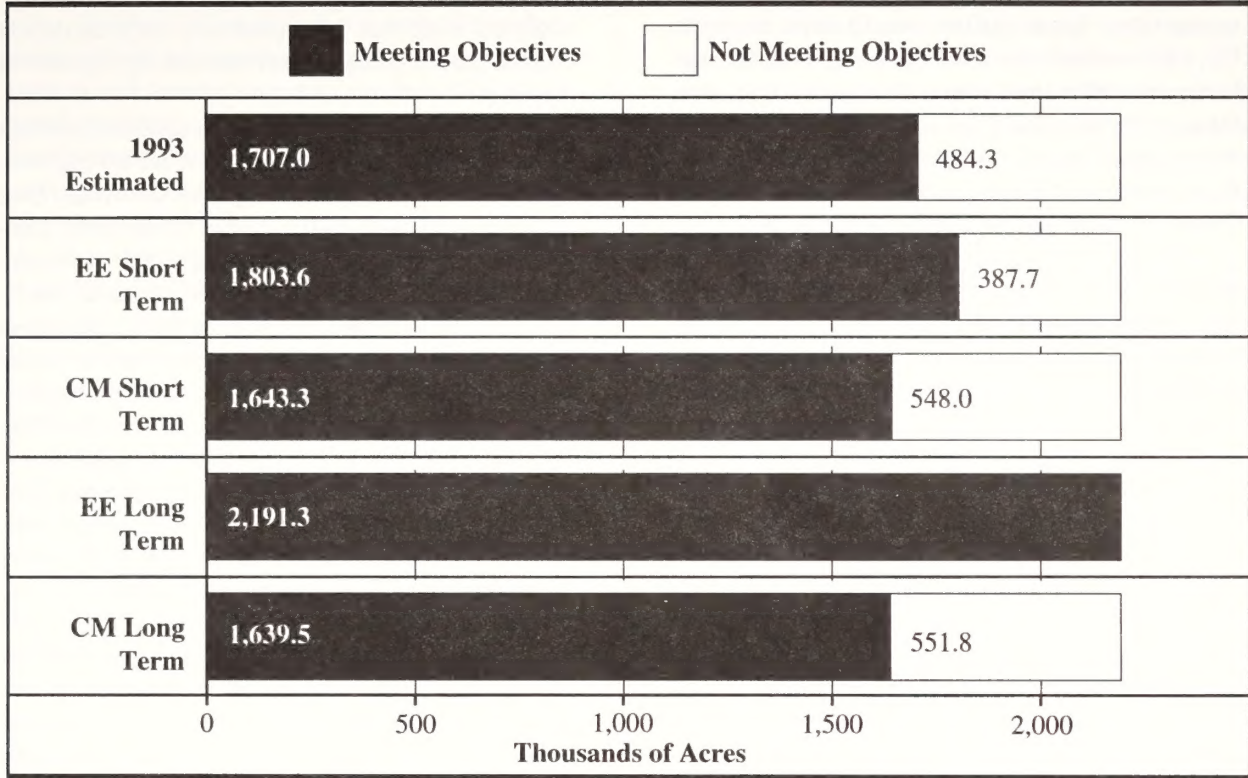
improvements would benefit many other resources associated with high-quality riparian areas. Specific management would result in an overall positive trend and rapid improvement of the condition of riparian areas. Improvements would result from implementing national standards and guidelines, emphasizing ecosystem management, removing livestock from critical or unsuitable areas, and allowing more public involvement in managing rangeland resources.

The Environmental Enhancement alternative would lead to opportunities to selectively rest targeted areas to help restore native vegetation and increase residual vegetation, litter, and





**Figure 4-20: Change in Status- Forest Service Riparian, Environmental Enhancement Alternative**



the accumulation of organic material. Many mountain meadows lie in designated wilderness areas. Immediately eliminating livestock grazing would lead to the rapid establishment and growth of willows and other mesic shrubs. Removing livestock would dramatically improve the vertical and horizontal structure of shrubs. Plant litter would rapidly accumulate in most meadows. But in some degraded meadow systems with entrenched streams, major vegetation changes would take 50 years or more because lower water tables provide less moisture for plant growth.

Native sedges and other plants adapted to maintain soil stability would increase in flood-prone areas. Plants adapted to drier soil conditions and less suited to maintaining soil stability under flooding (Kentucky bluegrass, forbs, and sagebrush) would correspondingly decrease. These changes should occur relatively rapidly because much of this vegetation type occupies areas with high water tables and growth potential. Continued opportunity to graze would allow the long-term use of grazing as a management tool to increase meadow vigor.

## Watershed

### Upland

In the short term, upland watershed conditions would start to respond to management changes under the Environmental Enhancement alternative although the upland drainage system would not respond significantly. (See Figures 4-17 and 4-18.) The most noticeable changes would result from livestock being removed from areas that are functioning but susceptible to degradation, nonfunctioning, or not meeting management objectives.

In the long term, upland watershed conditions would significantly improve. Vegetation and litter cover would increase, and the physical properties of the soil would improve. Run-off and erosion would decrease. These changes would result partially from grazing practices, but the greatest change would result from removing livestock from areas that are not in proper functioning condition, are functioning but susceptible to degradation, or are not meeting management objectives.



The upland drainage network would improve significantly in the long term. Reduced grazing pressure would allow upland gullies to revegetate. Some gullies would even begin to fill with sediment. The hydrology of the uplands would reflect these changes with reductions in the size and frequency of upland floods. More rapid improvement would result under Environmental Enhancement from removing livestock from special designation areas.

Upland watershed conditions would improve in response to implementing national and regional standards and guidelines on BLM-administered lands and requiring standards and guidelines to be developed through Forest Service land use plans. Measures to ensure meeting these standards and guidelines would be incorporated into the terms of grazing permits.

Changes in the use of Range Betterment Funds would emphasize the proper repair or abandonment of existing watershed projects that have exceeded their useful life expectancy.

The sagebrush, desert shrub, and pinyon-juniper communities with less than 10 inches of annual precipitation would only slowly respond to management actions.

In the short term, the Environmental Enhancement alternative would not measurably affect erosion and runoff rates because at least 3 years would be needed to inventory, classify, and remove livestock from all uplands deemed unsuitable for livestock grazing.

## Riparian/Wetland/Aquatic

The overall hydrologic function of riparian-stream systems would improve under Environmental Enhancement. Lateral or vertically unstable stream channels, especially in low sediment yield or highly fluctuating flow environments, would move toward a functioning condition. The rapid trend towards proper functioning condition would mainly result from applying standards and guidelines, suspending grazing on areas not in proper functioning condition, and eliminating grazing in sensitive areas: wilderness, wilderness study areas, developed recreation sites, threatened and endangered species habitat with livestock conflicts, and areas of national and historic cultural significance.

Accelerated rates of runoff and sediment from uplands would progressively diminish as areas achieve proper functioning condition. Erosional stresses and sediment loading would de-

cline in local stream channels. Coniferous forests and mountain shrub communities would achieve functioning conditions faster than ecosystems with less precipitation, such as desert shrub, pinon-juniper, and sagebrush vegetation types.

The condition of riparian-stream systems would also improve as a result of removing livestock from nonfunctioning riparian areas. (See Figures 4-19 and 4-20.) In the short term sediment yields from the trampling of streambanks and riparian areas would be minimized. As riparian systems approach functioning condition in the long term, these sediment effects would be negligible. Stability would be restored to presently unstable channels, partly as a result of the improved condition of riparian tree and shrub communities. These communities also regulate water temperatures and dissolved oxygen levels. Over the long term, hydrologic functions (overbank flooding, water quality maintenance, flood peak reduction, groundwater recharge, and maintenance of low flow) would progressively be restored in nonfunctioning areas.

In both the short and long term, nonpoint-source pollution from livestock would rapidly decrease from both upland and riparian sources. This rapid improvement in water quality would mainly result from applying the standards and guidelines, suspending grazing in areas not in proper functioning condition, and eliminating grazing in some sensitive areas: wilderness, wilderness study areas, developed recreation sites, threatened and endangered species habitat with livestock conflicts, and areas of national and historic cultural significance.

Managing all areas for proper functioning condition would result in upland and riparian sediment and salinity yields approaching natural levels over the long term. Other grazing pollutants—fecal bacteria and nutrient enrichment—would diminish with fewer livestock on the range and less runoff to carry pollutants to streams.

Nonpoint-source salinity in the Colorado River basin, being predominantly associated with runoff and sediment yields from arid-desert shrub communities, would also decline but at a slower rate because of the slow response of this vegetation type to management.

Under the Environmental Enhancement alternative, water quality would improve over the short term in response to implementing national standards and guidelines and other policy ob-



jectives covering ecological goals, acceptable limits, and desired plant communities for areas where livestock grazing is the main economic use. Implementing full force and effect decisions would help prevent further degrading of upland and riparian-aquatic communities threatened by livestock grazing. Range Betterment Funds would be used to help rehabilitate threatened or nonfunctioning watersheds and riparian-aquatic habitats.

Over the long term, watersheds, water quality, and riparian-aquatic habitats would maintain their properly functioning condition since livestock would graze only where range monitoring finds no environmental threat. BLM and the Forest Service would become better federal land managers by involving interested people and groups, using multiple resource advisory councils, and implementing decisions based on ecosystem management principles.

Cumulative impacts under the Environmental Enhancement alternative would be similar to continuing current management in the long term. In the short term, however, significant forage reductions under Environmental Enhancement would have a greater cumulative impact than under Current Management in some areas in the West and would accelerate some ongoing trends.

## Wildlife

Improvement in upland and riparian vegetation and watershed condition would increase the amount of food and cover for many terrestrial and aquatic wildlife species. Numbers and diversity would correspondingly increase.

Changing the focus from "continuing grazing until monitoring shows a problem" to "authorizing grazing only where enough data shows resource condition standards and goals to be met" would rapidly improve riparian areas in the short term. (See Figures 4-19 and 4-20 and riparian analysis in the Vegetation section for the Environmental Enhancement alternative.) In the long term such improvements to wildlife species would likely be sustained, either by not reauthorizing grazing or by limiting grazing to sustainable levels for properly functioning areas.

Under the Environmental Enhancement alternative, livestock would be removed from all currently grazed federal land that is in less than

properly functioning condition (including areas whose functioning condition is unknown) until areas are found to be functioning properly. In both the short and long term, rangeland ecosystems would benefit from rest by producing more forage and cover. Riparian areas would start a rapidly improving trend. In the long term, wildlife species would benefit from having more healthy, diverse ecosystems in which to meet life needs.

The Forest Service and BLM would consider certain sensitive areas unsuitable for livestock grazing: all areas not in proper functioning condition, designated wilderness and wilderness study areas, developed recreation sites, and critical wildlife habitat areas. In addition, anyone with an interest in livestock grazing could petition the departmental secretary with jurisdiction to designate an area unsuitable for livestock grazing or to end an unsuitable classification.

In the short term, Environmental Enhancement would only negligibly to slightly improve overall upland wildlife habitat for areas rested from grazing. The slight improvement would be due to the slow response of upland habitats, especially on more arid rangelands. In the long term, the overall improvement would be slight to moderate with a potential for significant improvement in the extended future. (See Figures 4-17 and 4-18.)

Changing BLM regulations to penalize operators that violate environmental laws and regulations would give BLM more flexibility in conserving public resources. Where that flexibility is used to protect riparian or ecosystem values and functions, wildlife species would indirectly benefit.

Changing the use and distribution of Range Betterment Funds from a livestock to an ecosystem emphasis would mean that the agencies would spend funds to benefit rangeland ecosystems, which would benefit wildlife. Riparian areas would greatly benefit because grazing would be allowed only in properly functioning areas. Funds would then be spent for improving areas in less than properly functioning condition.

Increasing opportunities for the public to participate in managing rangeland ecosystems would assure that wildlife concerns and needs are discussed at all levels of decisionmaking within both agencies. With more emphasis on ecosystems and ecosystem processes, vegetation communities would improve in structure, di-



versity, and function. Improved riparian and upland conditions would benefit big game, upland game, waterfowl, raptors, and fish by providing more diverse, healthy ecosystems for upland game to meet life requirements.

Changing regulations so that appealed BLM decisions would not automatically be stayed would alleviate short-term resource damage. Riparian and upland areas would benefit in the short term when corrective actions are taken to stop resource damage. If these short-term benefits lead to improved conditions in the long term, big game, upland game, waterfowl, raptors, and fish would benefit.

## Big Game

Under the Environmental Enhancement alternative, upland vegetation types without livestock grazing would move more rapidly toward their potential natural communities. General vegetation changes would favor species in upper seral stages. For example, in areas occupied by elk and mule deer, elk would be favored where vegetation moves toward a higher percent composition of grasses. Big game populations would then move toward stability in the long term but would occupy different proportions of habitats than they do now. Species favored by these vegetation trends would include bighorn sheep and elk. Pronghorn antelope and mule deer habitat conditions would generally decline due to a shift from brushy to herbaceous vegetation. Habitat diversity would be maintained locally by land treatment projects and natural events.

The Environmental Enhancement alternative would improve the quality of riparian-dependent big game habitat and make these species better able to maintain populations. For example, mule deer depend on riparian habitat for thermal and hiding cover of both vertical and horizontal vegetation structure and seasonally prolonged succulent forage. These areas are especially important during fawn rearing. Dry and wet meadows provide valued foraging areas for bighorn sheep.

Riparian conditions would improve overall, moving moderately toward proper functioning condition. The quality of big game habitat would be improved by increases in woody vegetation in most riparian community types. Increased woody vegetation would increase the structural diversity of these areas and provide

higher quality hiding and thermal cover. The movement of riparian vegetation types toward potential natural communities would also increase the amount and quality of big game forage. Meadows would have succulent forage later into the dry season, providing better quality forage for a longer time.

## Upland Game and Nongame

By removing livestock from all but properly functioning riparian areas, the Environmental Enhancement alternative would lead to short-term vegetation regrowth in many areas. Keeping grazing out of those areas until they can sustain grazing without degradation would lead to long-term increases in plant species composition and structural diversity. Long-term improvements in riparian area functions would result in greater vegetation structural diversity and species composition, increased forage and cover, and greater ecosystem stability. All these improvements would benefit upland game and nongame.

Removing livestock grazing from sensitive areas and other parts of upland vegetation ecosystems would greatly accelerate the current upward trend for upland areas. Improving conditions in both riparian and upland areas would benefit upland and nongame by providing a more stable (diverse) ecosystem. Diverse, healthier ecosystems would contribute to the habitat and life needs of upland and nongame, as would an emphasis on managing entire watersheds for functioning characteristics.

## Waterfowl

In the short and long term, implementing national standards and guidelines under the Environmental Enhancement alternative would improve ecological conditions. Emphasizing the principles of ecosystem management and biological diversity, these standards and guidelines would encourage the agencies to rapidly recognize and resolve threatening conditions. The relative speed of this process would lead to immediate changes in waterfowl habitat rather than the current practice that requires several years of monitoring data to document a nonfunctioning situation. The improved ecological condition of waterfowl habitat would involve reduced sedimentation from waterways, which would en-



courage aquatic plant growth and mean more food for waterfowl. Proper livestock management and less grazing pressure on wet meadows would improve waterfowl nesting and cover habitat. Increased plant species composition, plant vigor, residual plant cover, and functioning watersheds would improve nesting, brood rearing, and migration habitat.

## Raptors

Prey populations would increase as a result of the improved structural diversity of riparian vegetation, increased vegetation litter, and improved food supply. These conditions would lead to better nesting, hunting, and cover for riparian-dependent raptors. Riparian habitat improvements would also benefit riparian-dependent raptors where large cottonwood or other trees grow. Woody riparian habitat would improve relatively slowly but continually over the long term.

Upland habitats would improve slowly but steadily over the long term. Conditions expected under the Environmental Enhancement alternative would offer the best opportunities for achieving proper functioning condition and for improving upland and riparian habitats for raptors. These trends would benefit raptors and their prey dependent upon upland habitats.

## Resident and Anadromous Fish

Since the Environmental Enhancement alternative would authorize livestock grazing only where data show that habitat condition standards and goals have been met, degraded fish habitats would immediately improve and would significantly improve over the long term. Livestock grazing would be removed at first from roughly 1.3 million riparian acres. Eliminating grazing from unsuitable areas, especially degraded riparian areas, would rapidly improve the condition of riparian vegetation.

Fisheries scientists have concluded that resting riparian/aquatic habitats is the most compatible grazing strategy for fisheries resources (Platts 1991). As streambanks and channels are rebuilt, beavers would take on a more significant role closer to their historic levels. Resulting higher water tables would reestablish some historic riparian areas. Habitats for many native resident fish would increase or improve.

Similar to the Environmental Enhancement alternative is PACFISH (which is presently under development). PACFISH would be a BLM-Forest Service ecosystem approach to managing anadromous fish habitat. As yet no decisions have been made regarding PACFISH but some options under consideration could benefit resident and anadromous fish and their habitats. PACFISH could result in positive changes in riparian/aquatic habitat conditions along at least 17,350 miles of rivers and streams in the Coastal and Columbia Basin analysis areas.

The Environmental Enhancement alternative would expand prohibited acts to other federal and state laws, including violations of water quality standards that currently protect anadromous fish. Over the long term, this change would significantly benefit aquatic habitat where, in the past, conditions of grazing permits did not require permittees to comply with water quality laws.

## Special Status Species

Under Environmental Enhancement, BLM and the Forest Service would consider certain sensitive areas unsuitable for livestock grazing: all areas not in proper functioning condition, all areas functioning but susceptible to degradation, all areas whose functioning condition is unknown, designated wilderness and BLM and Forest Service recommended wilderness, and areas where livestock grazing conflicts with designated critical habitat for federally listed species. Removing livestock from areas of grazing conflict would result in accelerated short- and long-term trends toward properly functioning ecosystems.

These trends would follow vegetation improvements. For example, under Environmental Enhancement large amounts of desert shrub vegetation would be ungrazed in Mojave Desert tortoise habitat, as would a smaller amount of Sonoran Desert tortoise habitat in wilderness areas. Such changes would increase forage and cover for these species.

In the long term, changes in nonuse would reduce the incidental damaging of special status plants and promote more forage and cover or increased growth and regeneration for palatable plants in limited areas. Conservation organizations would acquire grazing permits and apply the nonuse provision to promote the habi-



tat traits of some upland special status species. Riparian/wetland or aquatic special status species in nonfunctioning or functioning but susceptible to degradation habitats would benefit from removing livestock grazing. The impact of nonuse would be most significant on the most productive sites, such as uplands with deeper soils in higher precipitation zones and riparian areas, which would most quickly respond to nonuse.

The immediate implementing of decisions that reduce grazing conflicts would benefit special status species.

Development of ecosystem-based multiple resource advisory councils would result in long-term trends toward improved habitat characteristics required by many special status species.

Trends toward plant community characteristics and ecosystem processes preferred by riparian and aquatic species would accelerate because many areas with livestock conflicts would go ungrazed. Changes toward habitat characteristics preferred by upland species would occur at a moderate rate.

## Wild Horses and Burros

Improved upland and riparian vegetation under the Environmental Enhancement alternative would improve habitat conditions for wild horses and burros where livestock have been eliminated because of nonfunctioning or functioning but susceptible to degradation determinations.

The Environmental Enhancement alternative related to water rights would result in the same impacts as the Proposed Action.

Under the Environmental Enhancement alternative, BLM would hold title to all future range improvements. BLM would consider the normal free-roaming nature of wild horses when locating and building livestock fences and water development for livestock grazing on public lands and in conducting land treatments. Rangeland improvements would be located to benefit a variety of resource uses, including wild horses. Wild horses would continue to use normal grazing use areas and dispersed water sources and would be less likely to be shut away from traditional use areas.

Interested individuals would become increasingly involved in managing wild horses. Determinations for managing resources would

become more consistent, resulting in less litigation. The time spent for litigation would be used for implementing resource decisions.

Replacing grazing advisory boards, multiple resource advisory councils would have a balanced focus toward local, regional, and national issues. Increasing the consideration of wild horse needs in local resource management, these councils would strongly influence the ownership, type, location, and design of range improvement projects. As a result, wild horses and burros would benefit.

## Recreation

By not allowing livestock to graze on developed recreation sites, the Environmental Enhancement alternative would eliminate the livestock impacts to facilities and users. Local improvements in water quality, especially in reduced bacteria counts, would improve site quality.

The development of fewer range improvements and the ability to declare more areas unsuitable for livestock grazing would increase future opportunities to develop recreation sites. The increased fencing of areas unsuitable for livestock grazing would hinder access to desirable places, but such impacts would be mitigated by design characteristics.

Impacts on undeveloped recreation sites would be greatly reduced by confining livestock grazing to areas in proper functioning condition. Impacts would decrease even more as more popular undeveloped areas are declared unsuitable for livestock grazing under the suitability nomination procedure. Grazing management would become more intensive and skillfully applied as permittees try to avoid conflicts and confrontation with other users.

The Environmental Enhancement alternative would change the scenic quality of federal lands in the West by removing livestock and range improvement projects from many areas, reducing fenceline contrasts, improving riparian areas, and reducing the number of new range improvement projects.

Improved riparian and aquatic conditions (see Figures 4-19 and 4-20) and increases in wildlife would allow more opportunities for recreation, including hunting and fishing, wildlife observation, and general recreation use. Improved water quality would reduce the risk of



disease transmission to recreation users drinking or having primary or secondary contact with water. Increased wildlife would increase opportunities for wildlife-related recreation in uplands.

The Environmental Enhancement alternative would also improve opportunities for guides and outfitters because of increased visitor service demands. Improved riparian and aquatic conditions would increase both the number of opportunities (longer seasons, more miles of floatable/fishable rivers and streams) and the quality of opportunities that already exist. The marketability of outfitter services would increase.

Users of single-event permits would benefit more under Environmental Enhancement than under the Current Management, Proposed Action, or Livestock Production alternatives, especially off-highway vehicle, mountain bike, horse, and other cross-country events.

## Wilderness

Under Environmental Enhancement, livestock would not graze wilderness areas and wilderness study areas (WSAs) recommended for designation. Vegetation condition, especially in riparian and aquatic areas would improve. Native and special status plants and animals would also increase. Existing range improvement projects would be abandoned, removed, or both. Undesirable plants would be less likely to be introduced and established. Overall, the naturalness, solitude, and primitive and unconfined recreation values of wilderness and WSAs would improve.

## Cultural and Paleontological Resources

Under the Environmental Enhancement alternative, grazing impacts would be reduced or eliminated where livestock are found to be unsuitable because of nationally significant cultural resource sites.

The agencies would address Native American concerns and the concerns of the archeological and historic preservation interests and would act against grazing permittees for violating the Archeological Resource Protection Act of 1979 and the Native American Graves Protection and Repatriation Act.

Removing livestock grazing from nonfunctioning and functioning but susceptible to degradation riparian sites would eliminate grazing impacts to cultural and paleontological resources in these areas. The improving of riparian resources to proper functioning condition would reduce the effects of erosion on cultural resources. Overgrazing of native food-source plants that provide lifeway values for Native Americans would be also be eliminated. Reduced construction of range improvements would lessen land disturbance and potential impacts to cultural and paleontological resources.

Environmental Enhancement would affect paleontological resources just as it would cultural resources.

## Economic Conditions

The impacts under the Environmental Enhancement alternative would result from a wide variety of trends currently affecting the agricultural industry in general and livestock production in particular. The trends are discussed in Chapter 3. In addition, a variety of emerging issues might accelerate or offset ongoing trends in agriculture in the future.

Population growth and demographic changes in the West and in many western rural communities will continue to transform rural economies. Population growth in many rural communities, while contributing to economic growth and diversification, will continue to diminish the relative importance of agriculture in those communities. But economic diversification also offers more opportunities to earn off-ranch income and thus help families maintain their ranches. Communities that continue to lose population and whose economies are in decline might be further strained by decreases in livestock production.

Land use changes, such as increased recreation use and subdivision of privately owned ranch lands, are both a cause and a result of trends in the agriculture industry. Economically marginal ranches may be encouraged to sell to developers where the demand for rural homesites is increasing, resulting in a further decline in agriculture. Increased outfitter and guide activities, which encourage more recreational use of rural areas and offer more income-earning potential to ranches, may contribute to popula-



tion growth and in turn accelerate changes in land use away from agricultural production.

Land use changes could affect community tax bases. The impact to a local economy of a change in livestock production depends on the relative size and growth trends in other sectors of that economy. Where a relatively significant livestock industry declines, tax revenues have a high probability of declining. On the other hand, where other sectors of the economy are stable or growing and a relatively small decline occurs within a large livestock industry (or a large decline occurs within a small livestock industry), major impacts to the tax base are unlikely.

Changes in land use may accelerate the decline in public access to public lands where access depends on crossing private lands. Reduced access may increase the demand for land adjustment (such as land exchanges or easement acquisition) by BLM and the Forest Service to obtain more access to public lands.

Policies aimed at recovery of endangered species such as desert tortoises, anadromous fish, and grey wolves, would continue to affect livestock production by restricting livestock grazing in endangered species habitat. On the other hand, future activities designed to avert habitat loss and endangered species listings may help sustain livestock production in the long term.

Eliminating the Federal Government's wool subsidy program over the next 3 years could accelerate the decline in sheep production in the West and may cause marginal sheep producers to sell their operations. Other government policies, such as trade agreements aimed at reducing international trade barriers, will also continue to affect the industry. Agreements of this kind may both increase and decrease livestock production, but the direction and magnitude of these impacts is beyond the scope of this EIS. The expiration of Conservation Reserve Program contracts beginning in 1996 might encourage the use of croplands for pasture, thereby increasing forage for livestock.

The most important direct and indirect economic effects that would result from implementing the Environmental Enhancement alternative are discussed in the following sections.

## Regional Economic Impacts

Effects on employment and income would stem from two sources: a reduction in federal

forage for livestock use and an increase in grazing fees charged for the remaining federal forage. Appendix N, MicroIMPLAN System and Methodology for Estimating Impacts to Employment and Income, describes the methodology used to assess economic impacts.

Under the Environmental Enhancement alternative, overall authorized use westwide (in the 17 western states) would decline by 50 percent 5 years after implementation and by 30 percent after 20 years. For Current Management, available forage would decline by 5 percent in 5 years and 20 percent in 20 years (18 percent for BLM and 19 percent for the Forest Service). These declines are predicted on the basis of trends over the past 10 years (reflected in Current Management), which are projected to continue, and management actions that are expected to significantly reduce the federal forage grazed by livestock in the short term. In comparison to Current Management, the Environmental Enhancement Alternative would provide 45 percent fewer AUMs available in the short term (5 years) and 10 percent fewer in the long term (20 years). The Environmental Enhancement alternative would result in the greatest short-term decline in forage of all alternatives except for No Grazing. In the long term, forage would be restored, but the amount available for livestock grazing would remain 30 percent lower than at present and 10 percent lower than under Current Management and the Proposed Action after 20 years.

Table 4-10 shows employment and income effects of the decline in federal forage grazed by livestock under the Environmental Enhancement alternative, across all fee levels. After 5 years, employment is estimated to decline by a range of 7,240 jobs (under the current PRIA fee alternative 1) to 7,820 jobs (under regional fees and competitive bidding—fee alternatives 4 and 7, respectively). Under the BLM-Forest Service proposed fee formula (fee alternative 3), employment is estimated to decline by 7,450 to 7,520 jobs<sup>7</sup>. The 5-year declines across all fee levels would amount to 0.5 percent of total westwide agricultural employment.

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<sup>7</sup> The impacts for the BLM/Forest Service Proposed Fee are presented as a range between those caused by a \$4.28 fee and those caused by a \$3.72 fee. See [Assumptions and Analysis Guidelines](#) for more information.





**Table 4-10: Decreases in Employment and Income 5 and 20 Years after Implementing the Environmental Enhancement Alternative**

	Fee Level						
	PRIA (Current)	Modified PRIA	BLM/FS Proposed	Regional	FFF	PRIA with Surcharge	Competitive Bidding
Decreased Employment							
After 5 Years	7,239	7,447	7,515	7,824	7,293	7,450	7,824
After 20 Years	4,388	4,674	4,768	5,195	4,463	4,679	5,195
Decreased Income (1993 \$)							
After 5 Years (\$000)	\$292,331	\$300,013	\$302,538	\$314,024	\$294,329	\$300,142	\$314,024
After 20 Years (\$000)	\$177,196	\$187,797	\$191,282	\$207,132	\$179,953	\$187,975	\$207,132

After 20 years, employment is estimated to decline by a range of 4,390 jobs (under the current PRIA fee) to 5,200 jobs under regional fees and competitive bidding. Under the BLM-Forest Service proposed fee formula, employment is estimated to decline by 4,679 to 4,770 jobs. The 20-year declines across all fee levels would amount to 0.3 percent of total westwide agricultural employment.

Total income after 5 years is estimated to decline by a range of \$292.3 million (under the current PRIA fee) to \$314 million under regional fees and competitive bidding. Under the BLM-Forest Service proposed fee formula, income is estimated to decline by \$300.1 million to \$302.5 million. The 5-year declines in income across all fee levels would amount to about 1 percent of total westwide agricultural income (See Figure 4-20a).

After 20 years, total income is estimated to decline by a range of \$177.2 to \$207.1 million (under the current PRIA fee about 0.6 percent of total agricultural income westwide; under regional fees and competitive bidding about 0.6 percent). Under the BLM-Forest Service proposed fee formula, the decline is estimated to amount to be between \$188 million and \$191.3 million (about 0.6 percent) (See Figure 4-20a). (Table 4 in Appendix P, Change in Employment and Income After 5 Years and 20 Years of Implementation Under Different Fee Levels, contains more detailed information on employment and income impacts.)

Employment and income impacts would be greater under the Environmental Enhancement alternative in both the short and long term than

under the other alternatives except for No Grazing. But the impacts would be minor compared to current economic conditions and trends in the westwide economy as a whole, and in the agriculture sector in particular. Continued growth in employment and income in other sectors would tend to overshadow the relatively small employment and income reductions from declines in federal forage grazed by livestock.

Locally significant impacts, however, could result. For example, in the Coastal analysis area in the short term, livestock grazing in national forests would be virtually eliminated, creating a relatively greater economic impact than in the West as a whole. Even so, the impacts would not likely be significant, since only a third of BLM- and Forest Service-administered lands there are grazed, and only 2 percent of the total federal forage grazed by livestock is in the Coastal analysis area.

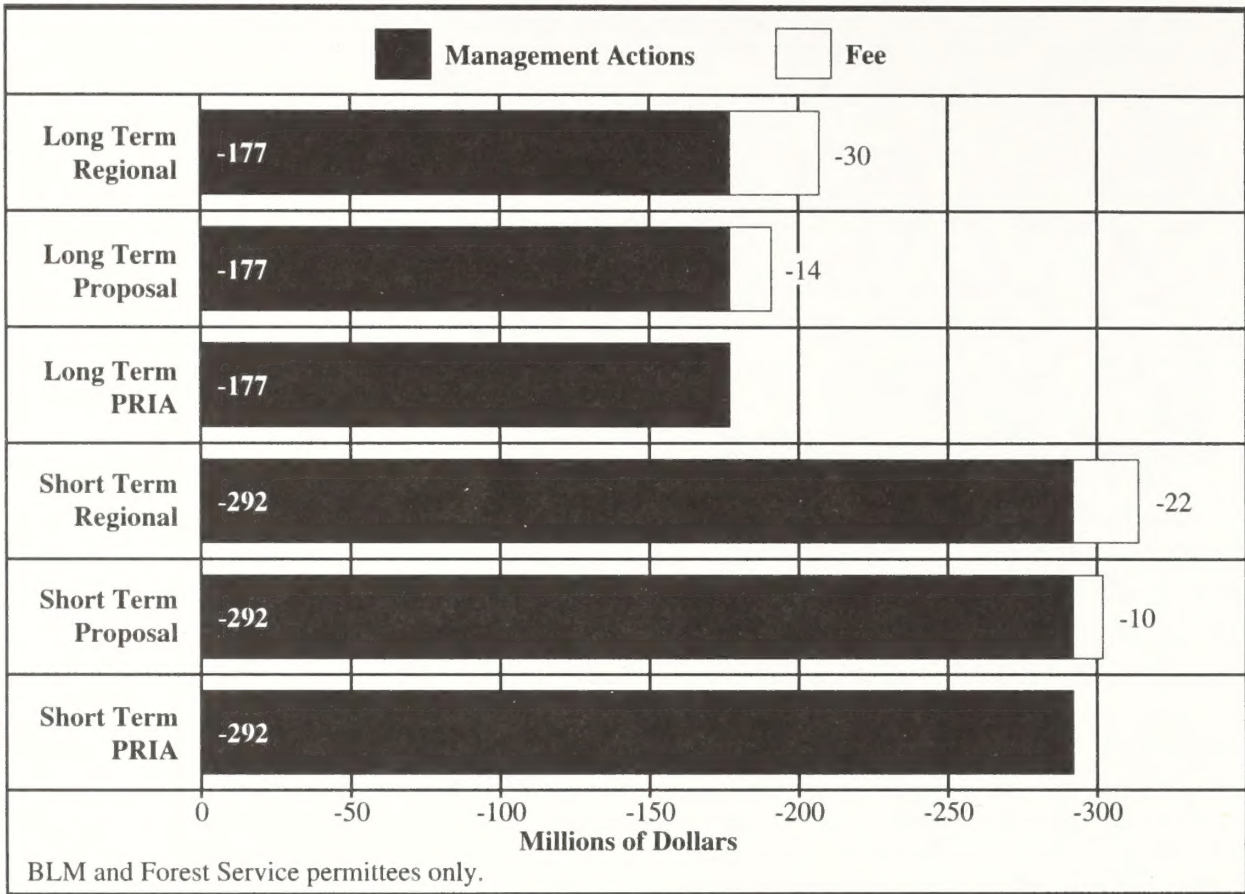
The impacts from reduced forage do not consider other factors that could mitigate overall impacts. For example, estimates of employment and income declines do not consider a 3-year or longer adjustment period for phasing in a higher grazing fee. Phasing in higher fees would reduce the short-term impacts.

Under the Environmental Enhancement alternative, improved resource conditions in the long term would create beneficial impacts greater than under all other alternatives except for No Grazing. Greatly improved wildlife habitat and recreation site improvements would generate increases in employment and income with increased opportunities to hunt, fish, and view wildlife. These impacts would result both from





**Figure 4-20a: Reductions in Income, Livestock Industry, Environmental Enhancement Alternative**



changes in resource management and increases in Range Betterment Funds from higher grazing fees. But because fewer livestock could graze under Environmental Enhancement than under Current Management, the Proposed Action, or Livestock Production, the Environmental Enhancement alternative would generate relatively fewer Range Betterment Funds.

### Ranch Income and Operation Impacts

This section describes the impacts to ranch operations and ranch income of changes in forage allowed for livestock grazing, increases in grazing fees, and regulation changes that would potentially affect operations. Impacts are shown for three hypothetical herd sizes: 425 cows, 210 cows, and 90 cows. Impacts are also considered for two levels of federal forage dependency for each of these three operations: 60 percent and 30 percent. Appendix O, Changes in Ranch Re-

turns from Reduced AUMs and Higher Grazing Fees, describes the methodology used to assess the impacts to ranch operations.

One impact common to all alternatives is that herd sizes would decrease as access to federal forage declines. (The extent of decreases would vary by alternative, depending on the reduction in federal forage). Further, all else being equal, net cash returns (cash receipts minus expenses) would decrease as herd sizes decrease.

Under the Environmental Enhancement alternative, authorized use would decrease by 50 percent after 5 years and by 30 percent over 20 years, the greatest short-term decline in forage under all alternatives except No Grazing. In the long term, livestock grazing would be restored but would remain 30 percent lower than under current conditions and 10 percent lower than under Current Management after 20 years. These figures are a westwide average and do not necessarily represent the forage reductions projected for all ranches.



Table 4-11 shows estimated losses in net cash returns to the six hypothetical operations over the short and long term as a result of reduced federal forage. These impacts are shown for the current PRIA fee level (\$1.86), the BLM-Forest Service proposed formula (\$3.96)<sup>8</sup>, and the weighted average regional fee level (\$6.38).

In this analysis, the impacts would be greatest for a herd size of 425 cows and a 60 percent dependency on federal forage. In the short term, a 50 percent reduction in forage at the current fee level would decrease net cash returns by

\$11,400. At \$3.96/AUM, net cash returns would decline by \$15,100 in the short term. And at \$6.38/AUM, net cash returns would decline by \$13,300 in the short term.

In the long term, federal forage would increase but remain at 30 percent below current levels. A 30 percent reduction in forage at the current fee level would decrease net cash returns (cash receipts minus expenses) by about \$6,800. At \$3.96/AUM, net cash returns would decline by \$12,000 in the long term. And, at \$6.38/AUM, net cash returns would decline by \$16,500 in the long term.

This operation, with a herd size of 425 and 60 percent dependency on federal forage, is assumed now to use 3,060 AUMs (425 \* 12 months \* 0.6). After 5 years, the operation would use 2,900 AUMs, and would use 2,450 AUMs after 20 years. While the income impacts might be

<sup>8</sup> The analysis for the BLM/Forest Service Proposal is actually based on a \$4.28 fee. \$4.28 is the value that would be produced with a FVI of 1.08. See **Assumptions and Analysis Guidelines** for more information.

**Table 4-11: Impacts to Ranch Operations under the Environmental Enhancement Alternative**

Alternative 4: Environmental Enhancement	Ranch Attributes			Herd Impacts	Net Cash Returns Lost		
	Herd Size	Percent Dependency on Federal Forage	Percent AUM Reduction	# of Cows Lost per Permitted Herd	Due to Smaller Herd Size <sup>1</sup>	At \$3.96/AUM <sup>2</sup>	At \$6.38/AUM <sup>3</sup>
Year 5	425	60.0	50.0	132.6	\$11,404	\$15,107	\$18,320
	425	30.0	50.0	66.3	5,702	7,553	9,160
	210	60.0	50.0	65.5	5,633	7,463	9,050
	210	30.0	50.0	32.8	2,821	3,736	4,530
	90	60.0	50.0	10.0	860	1,644	2,324
	90	30.0	50.0	5.0	430	822	1,162
Year 20	425	60.0	30.0	79.6	6,846	12,030	16,528
	425	30.0	30.0	39.8	3,423	6,015	8,264
	210	60.0	30.0	39.3	3,380	5,941	8,164
	210	30.0	30.0	19.7	1,694	2,975	4,086
	90	60.0	30.0	11.2	963	2,061	3,013
	90	30.0	30.0	5.6	482	1,031	1,507

<sup>1</sup> Net cash returns lost at current fee level.

<sup>2</sup> Net cash returns lost due to herd size reductions plus increased fee (to \$4.28/AUM) on remaining federal forage. This analysis for the BLM/Forest Service Proposal of \$3.96 is based on a \$4.28 fee. \$4.28 is the value that would be produced with a FVI of 1.08 instead of an FVI of 1 as proposed. See **Assumptions and Analysis Guidelines** for more information. The impacts presented here are overstated by 3 to 12 percent, depending on the management alternative.

<sup>3</sup> Net cash returns lost due to herd size reductions plus increased fee (to \$6.38/AUM) on remaining federal forage. \$6.38/AUM is the average value of the regional fees (weighted by the number of AUMs in each state charged at each fee level).



significant for this operation and other operations with a large number of federal AUMs, only 8 percent of BLM permits and 4 percent of Forest Service permits allow more than 2,000 AUMs. Seventy-five percent of BLM permits and more than 50 percent of Forest Service permits allow no more than 500 AUMs.

The 90-cow operation with a 60 percent federal forage dependency described here is most closely associated with the permit size category of 500 or fewer AUMs. This operation is assumed now to have about 650 AUMs ( $90 * 12 \text{ months} * 0.6$ ). The 210-cow operation with 30 percent dependency and 760 AUMs is also representative of this permit-size category.

While the main adjustment permittees make to reduced forage would be to decrease their herd sizes, they could respond in other ways: substituting other forage (leasing more private pasture), using supplemental feed (hay), increasing the productivity of private lands (pushing ditches further up the sideslopes or installing wells and center pivot sprinkler systems to increase vegetation on private property), or encouraging federal agencies and state game officials to install wildlife bait stations to keep elk and deer in the uplands to reduce competition for forage. These responses would somewhat offset losses of federal forage.

Reductions in federal forage would have the greatest impact on permittees most highly dependent on federal forage to meet their total feed requirements. The impact of the reductions would vary with the financial condition of the ranch. Unprofitable ranches would be further stressed by reductions in federal forage and higher grazing fees. The more profitable a ranch, the better it would deal with higher fees and reduced access to federal forage.

The effect of reduced federal forage and higher grazing fees would also depend on a ranch's flexibility in finding and purchasing alternative forage sources. Ranches with the fewest alternatives and least flexibility would reduce the number of livestock the most in response to higher fees and less forage. Even ranches that do not highly depend on federal forage would be stressed by reductions if they cannot find suitable and affordable alternative forage.

Several proposed regulation changes under the Environmental Enhancement alternative might also affect ranch operations. Permittees are most likely to be affected by eliminating

subleasing on BLM allotments, allowing appealed decisions to be placed in full force and effect, allowing conservation use, and changing permit tenure. Eliminating subleasing would reduce the profitability of operations where sublessees pay a higher rate than the current PRIA fee level. Placing decisions into full force and effect might reduce ranch income by limiting livestock production. Allowing conservation use for up to 10 years at the permittee's request would benefit an operation and might increase forage in the long term.

Granting permit tenure for up to 10 years on the basis of performance would harm only permittees who lose their current 10-year permit tenure due to nonperformance. Losing tenure might slightly hurt a permittee's credit standing.

Under the Environmental Enhancement alternative, the public can petition to close areas to livestock grazing. Eliminating livestock grazing in such areas would reduce ranch income, depending on the level of livestock grazing affected, the permittee's dependence on federal forage, and the permittee's ability to obtain alternative forage.

The impacts of reduced federal forage, higher grazing fees, and regulation changes would be somewhat lessened by phasing in an increase in grazing fees over a 3-year or longer period. Additionally, where forage is gradually reduced, permittees could adjust their operations. Other potential measures that would lessen impacts would be a two-tiered grazing fee system under which small family ranches might pay lower fees than larger commercial ranches or an incentive-based fee system under which permittees would be given financial or other incentives for good stewardship practices. Increases in Range Betterment Funds resulting from higher grazing fees under several fee alternatives may also help mitigate losses to ranches by funding more improvements that benefit livestock.

## Grazing Fee Receipt and Payment Impacts

Table 4-12 shows changes in grazing fee receipts under the Environmental Enhancement alternative at all fee levels. For several scenarios, grazing fee receipts would decline from current conditions. Under the current PRIA fee and the



**Table 4-12: Environmental Enhancement Alternative: Change in Grazing Fee Receipts (over current) after 5 Years and 20 Years under Different Fee Alternatives**  
(Millions of 1993 \$)

	Current	Current PRIA Fee		Modified PRIA Fee		Proposed Action Fee		Regional Fees and Competitive Bidding		Federal Forage Fee		PRIA with Surcharge	
		5 Years	20 Years	5 Years	20 Years	5 Years	20 Years	5 Years	20 Years	5 Years	20 Years	5 Years	20 Years
Range Betterment Fund (RBF)	\$15.39	\$7.69	\$10.77	\$15.27	\$21.37	\$17.71	\$24.79	\$26.39	\$36.95	\$9.76	\$13.67	\$15.39	\$21.54
BLM	\$9.47	\$4.73	\$6.63	\$9.39	\$13.15	\$10.89	\$15.25	\$16.23	\$22.73	\$6.01	\$8.41	\$9.47	\$13.25
USFS	\$5.92	\$2.96	\$4.15	\$5.88	\$8.23	\$6.82	\$9.54	\$10.16	\$14.22	\$3.76	\$5.26	\$5.92	\$8.29
Payments States/Countries	\$6.00	\$3.00	\$4.20	\$5.95	\$8.33	\$6.90	\$9.66	\$10.28	\$14.40	\$3.80	\$5.33	\$6.00	\$8.40
BLM	\$3.32	\$1.66	\$2.33	\$3.30	\$4.61	\$3.82	\$5.35	\$5.70	\$7.98	\$2.11	\$2.95	\$3.32	\$4.65
USFS	\$2.67	\$1.34	\$1.87	\$2.65	\$3.71	\$3.08	\$4.31	\$4.59	\$6.42	\$1.70	\$2.38	\$2.67	\$3.74
Receipts to Fed Treasury	\$9.39	\$4.70	\$6.57	\$9.32	\$13.04	\$10.81	\$15.13	\$16.11	\$22.55	\$5.96	\$8.34	\$9.39	\$13.15
BLM	\$6.14	\$3.07	\$4.30	\$6.09	\$8.53	\$7.07	\$9.90	\$10.54	\$14.75	\$3.90	\$5.46	\$6.14	\$8.60
USFS	\$3.25	\$1.62	\$2.27	\$3.22	\$4.51	\$3.74	\$5.23	\$5.57	\$7.80	\$2.06	\$2.89	\$3.25	\$4.55
<b>Total</b>	\$30.78	\$15.39	\$21.54	\$30.53	\$42.74	\$35.41	\$49.57	\$52.78	\$73.90	\$19.53	\$27.34	\$30.78	\$43.09
BLM	\$18.93	\$9.47	\$13.25	\$18.78	\$26.29	\$21.78	\$30.49	\$32.47	\$45.45	\$12.01	\$16.82	\$18.93	\$26.50
USFS	\$11.85	\$5.92	\$8.29	\$11.75	\$16.45	\$13.63	\$19.08	\$20.32	\$28.45	\$7.52	\$10.52	\$11.85	\$16.59
BLM	\$18.93	\$9.47	\$13.25	\$18.78	\$26.29	\$21.78	\$30.49	\$32.47	\$45.45	\$12.01	\$16.82	\$18.93	\$26.50
RBF	\$9.47	\$4.73	\$6.63	\$9.39	\$13.15	\$10.89	\$15.25	\$16.23	\$22.73	\$6.01	\$8.41	\$9.47	\$13.25
Payments States/countries	\$3.32	\$1.66	\$2.33	\$3.30	\$4.61	\$3.82	\$5.35	\$5.70	\$7.98	\$2.11	\$2.95	\$3.32	\$4.65
Receipts to Fed Treasury	\$6.14	\$3.07	\$4.30	\$6.09	\$8.53	\$7.07	\$9.90	\$10.54	\$14.75	\$3.90	\$5.46	\$6.14	\$8.60
USFS	\$11.85	\$5.92	\$8.29	\$11.75	\$16.45	\$13.63	\$19.08	\$20.32	\$28.45	\$7.52	\$10.52	\$11.85	\$16.59
RBF	\$5.92	\$2.96	\$4.15	\$5.88	\$8.23	\$6.82	\$9.54	\$10.16	\$14.22	\$3.76	\$5.26	\$5.92	\$8.29
Payments States/Countries	\$2.67	\$1.34	\$1.87	\$2.65	\$3.71	\$3.08	\$4.31	\$4.59	\$6.42	\$1.70	\$2.38	\$2.67	\$3.74
Receipts to Fed Treasury	\$3.25	\$1.62	\$2.27	\$3.22	\$4.51	\$3.74	\$5.23	\$5.57	\$7.80	\$2.06	\$2.89	\$3.25	\$4.55



federal forage fee (alternatives 1 and 5 respectively), receipts would decline both after 5 and 20 years. Under the modified PRIA fee (fee alternative 2), receipts would decline in the short term (5 years).

Under alternative 6, PRIA with surcharges, grazing fee receipts in the short term would remain unchanged from current conditions. This lack of change would result from two assumptions that would cancel each other out: 1) that the surcharge would double the current fee from \$1.86 to \$3.72; and 2) that in the short term forage would decline to half the current level. Over the long term, receipts would increase by \$12.3 million (40 percent).

Under the current PRIA fee, receipts would decline by 50 percent over 5 years (\$15.4 million) and by 30 percent over 20 years (\$9.2 million). Under the federal forage fee (alternative 5), receipts would decline by \$11.2 million (37 percent) over 5 years and by \$3.4 million over 20 years (11 percent). Under the modified PRIA fee (alternative 2), receipts would decline slightly in the short run by \$246,000 (0.8 percent) but increase in the long term by \$12 million (39 percent).

Under the other fee levels, grazing fee receipts would increase over current conditions. The regional fees (alternative 4) would generate the greatest increases: \$22 million in 5 years (71 percent) and \$43.1 million in 20 years (140 percent). The BLM-Forest Service proposed fee formula (alternative 3) would generate \$4.6 million in 5 years (15 percent) and \$18.8 million in 20 years (61 percent).

Table 4-12 shows the distribution of receipts to Range Betterment Funds, payments to states and counties, and revenues to the U.S. Treasury. Assuming that the distribution of grazing fee receipts remains the same, these three categories would change by the same percentage. Table 4-12 also shows grazing fee receipts for both BLM and the Forest Service.

Also see Table 4, Environmental Enhancement alternative, in Appendix Q, Total Grazing Fee Receipts after 5 Years and 20 Years under Different Fee Alternatives, for total grazing fee receipts under all fee levels.

## Social Conditions

### Permittees

In the short term under the Environmental Enhancement alternative, the income losses experienced by the average permittee (with a herd size of 210 cows and a 30 percent dependency rate) would be \$2,821 annually at the current fee level; \$3,736 at \$3.96/AUM; and \$4,530 at \$6.38/AUM. In the long term, the losses for the same average permittee would be \$1,694 annually at the current fee level, \$2,975 at \$3.96/AUM, and \$4,086 at \$6.38/AUM. Some permittees would have greater losses than the average. Others would have smaller losses.

The size of the loss for any permittee would depend on the size of the operation, the dependency on federal forage, the amount of forage lost, and the grazing fee. The effect of the loss on any individual permittee would vary, depending on the size of the loss, the financial condition of the operation, and the dependence of the ranch family on the operation.

Losses in ranch income would result in declines in the economic well-being of some permittees and their families. Lifestyle changes in response to the income loss would include families decreasing their spending, diversifying operations to make them less dependent upon ranching, or sending family members to work off the ranch to bring in more income. Economically marginal ranches may be encouraged to sell, either to other ranchers or to developers in regions where demand for rural homesites is increasing. Most permittees would try to adjust their operations to absorb the income losses rather than sell their ranches because maintaining the ranching lifestyle is important to them. But under the Environmental Enhancement alternative, particularly at the higher fee levels, some ranches could no longer stay in business.

Under Environmental Enhancement at all fee levels, losses in income would be greater than under the Proposed Action, particularly in the short term. Changes in regulations might make permittees move their cattle more often and maintain more fencing. Rancher concerns about this alternative would include reductions in forage, the broadened representation on advisory boards and councils, BLM ownership of all future range improvements, surcharges for sub-



leasing, and losses in permit value reducing the value of ranches. A large fee increase would intensify the effects of Environmental Enhancement because permittees with higher dependencies on federal forage would be paying higher fees for much smaller herds.

Social impacts to permittees, ranching families, and ranch employees could be far reaching and could have serious social consequences if the Environmental Enhancement alternative is selected. Personal characteristics of self-sufficiency, independence, hard work, and other traits associated with the ranching lifestyle would be deeply shaken for many permittees. The social consequences discussed in the Impacts Common to All Alternatives section at the beginning of Chapter 4 would be accelerated under Environmental Enhancement.

For many residents of the ranching community, the Environmental Enhancement alternative, particularly at higher fee levels, would intensify feelings of mistrust and loss of personal control over their lifestyle. This resulting negative attitude toward BLM, the Forest Service, and the Federal Government in general, would make it harder for the agencies to work with permittees. Interactions with other public land users would continue to be stressful for the ranching community under this alternative.

Some permittees would close off access to their base property and any access they control to public land to exert some control over their land. Some permittees might simply refuse to pay the higher fees or to follow the new regulations.

In the long term, some permittees might prefer managing from this ecological perspective and working closely with government agencies and other interested publics. If rangeland conditions improve as predicted and livestock grazing allotment numbers and use likewise increase, the expected long-term result would be that the current rancher distrust and anger toward government agencies and others would subside.

## Counties and Communities

Westwide in the short term under the Environmental Enhancement alternative, 7,240 jobs would be lost at the current fee level, between 7,450 and 7,520 jobs would be lost at \$3.96/AUM, and 7,820 jobs would be lost at \$6.38/AUM.

In the long term, 4,390 jobs would be lost at the current fee level, between 4,680 and 4,770 jobs would be lost at \$3.96/AUM, and 5,200 jobs would be lost at \$6.38/AUM. These losses represent jobs in all sectors of the economy—ranch employment as well as jobs that directly and indirectly relate to ranching. These job losses would be much higher than under the Proposed Action, especially in the short term. Job losses at all fee levels would be insignificant at the westwide level. Some projected declines in employment would be absorbed through retirements and people seeking other types of work in the normal course of their lives.

The effects of the Environmental Enhancement alternative could include the outmigration of some permittee families whose operations or businesses could not support them. Families dependent upon local businesses, particularly agricultural supply and retail stores, could also be affected. The level of outmigration would depend on the financial condition of the permittees, their job skills, and local employment opportunities. The effects of this alternative would be similar to but much more severe than those under the Proposed Action.

“Typical small communities” (as described in Chapter 3) are most likely to be affected under this alternative because they are now losing population and have a lower capacity to respond to change. In other areas, such as Gunnison County, Colorado, population declines from permittee family outmigration might be offset by people moving into the area as part of the rural development trend. New people might have different attitudes and values than the people leaving the area and would probably place less importance on the traditional values of ranching families. The potential effects of job and population losses on local communities are described in the Impacts Common to All Alternatives section at the beginning of Chapter 4.

Grazing fee increases would be highest in areas with a high average dependency on federal grazing, such as Gunnison County. The effects of these fee increases would depend on the financial condition of local ranches and local economic conditions. In areas where there are few permittees, the community population is large and the economy is diverse, fee increases would be insignificant at the county and community levels.



In some communities such as Rawlins, Wyoming, residents believe that ranching is an important part of their community and lifestyle. Residents would be highly concerned about the change in emphasis away from livestock management and would strongly resent any alternative that greatly reduced livestock grazing on public lands. Environmental Enhancement would improve recreation quality, but local recreationists and those promoting recreation as a way to diversify the local economy would probably not favor this alternative because of its potential to harm permittees and the community.

Residents would tend to attribute any sale of a permittee's operation to changes in livestock grazing on public lands, even if the sale resulted from other factors. Residents and permittees would probably also feel increased resentment and distrust toward the Federal Government and federal agencies because of reduced local control over the management of public lands. Such feelings would make future cooperation between many local people and BLM and the Forest Service extremely difficult, even in the long term.

Where rural areas are being developed, ranchers and some newcomers are concerned that Rangeland Reform '94 will accelerate the urbanization process.

Where the population is more diverse, such as Gunnison, Colorado, Environmental Enhancement would probably appeal to newcomers, people interested in tourism, and environmental and recreation groups. But recreationists and environmentalists who fear loss of recreation access and open space due to development might be reluctant to support Environmental Enhancement. In the short term, differences in opinions and values among community groups could result in less cooperation and support among groups within these communities.

## National Impacts

Increasing numbers of people in the West and across the country believe that rangeland management should emphasize protecting rangeland resources rather than managing livestock. Most people also support agricultural use of the land. Some people may feel that Environmental Enhancement offers a good balance of protecting riparian and wildlife resources while allowing livestock grazing to continue on

federal lands. Others may feel that this alternative too heavily restricts livestock grazing. People who favor this alternative would feel satisfied about government in general, BLM and the Forest Service, and the policymaking process.

Some recreationists and many environmentalists would believe that the Environmental Enhancement alternative offers a proper balance between livestock grazing and protecting wildlife and riparian areas. The condition of these resources is important to these groups because they value them as potential recreation areas and many appreciate just knowing that these areas exist and will continue to exist in the future. Others, however, feel that this alternative restricts livestock grazing too much. Still others might feel that the alternative does not restrict livestock grazing enough. Generally people living close to the affected communities would support the livestock industry more than those living further away.

Increasing numbers of people across the country, including some ranchers who are not permittees, feel that livestock grazing fees should be increased. Raising grazing fees would be consistent with these attitudes.

## *Alternative 5: No Grazing*

### Grazing Administration

#### Livestock Use Levels

Under the No Grazing alternative, livestock would not graze BLM- and Forest Service-administered lands except where temporary grazing is needed in vegetation treatments to meet resource objectives. BLM and the Forest Service would have few grazing-related responsibilities. Grazing fees would no longer contribute to the U.S. Treasury, and livestock management work in both agencies would decline.

BLM and Forest Service would better control grazing. Without other livestock management responsibilities, both agencies would spend more time and money monitoring and resolving unauthorized use. During the short term, unauthorized use would probably increase. But as neighboring livestock operators become familiar with no grazing policies and boundary fences are built, the increase should level off.



BLM and Forest Service permittees would salvage range improvements not directly benefitting wildlife, watershed, or recreation. The agencies would pay permittees for the current value of their investments in range improvements. In the short term, this endeavor would be expensive.

### **Availability and Use of Range Betterment Funds**

If livestock grazing is eliminated on federal lands, grazing fee receipts and the Range Betterment Funds would fall to zero. Loss of Range Betterment Funds would mean no money for building, maintaining, or rebuilding range improvements other than from agency appropriations or private contributions. Although the need for many range improvements would be diminished or eliminated, many other range improvements would continue to be needed to help meet resource management objectives.

For example, interior or pasture fences generally would no longer be needed, but many boundary fences would continue to be needed to exclude livestock from federal lands. Other fences would also be needed where federal and private lands are highly intermingled and are now fenced together. Water developments built to better distribute livestock would also no longer be needed. If harmful to wildlife, these developments would be removed. Otherwise they would remain for wildlife use.

Loss of the Range Betterment Fund would be offset somewhat if the agencies can convert appropriated funds now spent on livestock grazing to other uses. But other sources of funding, including agency appropriations and private contributions, would become more important just to maintain a proper level of management. In local situations, riparian habitat and other resource conditions could be placed at risk, and enforcement costs would also likely rise.

In addition, loss of the Range Betterment Funds could also translate into foregone or delayed opportunities to increase resource monitoring and implement new rangeland projects aimed at improving ecosystem health: noxious weed control, prescribed burning, and similar activities for restoring degraded or nonfunctioning ecosystems.

## **Vegetation**

### **Upland**

In the long term under No Grazing, 69,373,000 acres (95 percent) of Forest Service uplands would either be meeting objectives or moving towards objectives (an increase of 18 percent); another 3,819,000 acres (5 percent) would not be meeting objectives (a decrease of 73 percent) (Figure 4-21).

In the short term, BLM upland acres in proper functioning condition would increase by about 5 percent, upland acres functioning but susceptible to degradation would decrease by about 5 percent, and upland acres in nonfunctioning condition would only slightly decrease.

In the long term, about 151 million (95 percent) of BLM upland acres would be in proper functioning condition (an increase of about 65 percent), no BLM upland acres would be functioning but susceptible to degradation, and about 8 million (5 percent) BLM upland acres would be in nonfunctioning condition (a decrease of about 60 percent). (Figure 4-22 shows the estimated changes to upland functioning condition.)

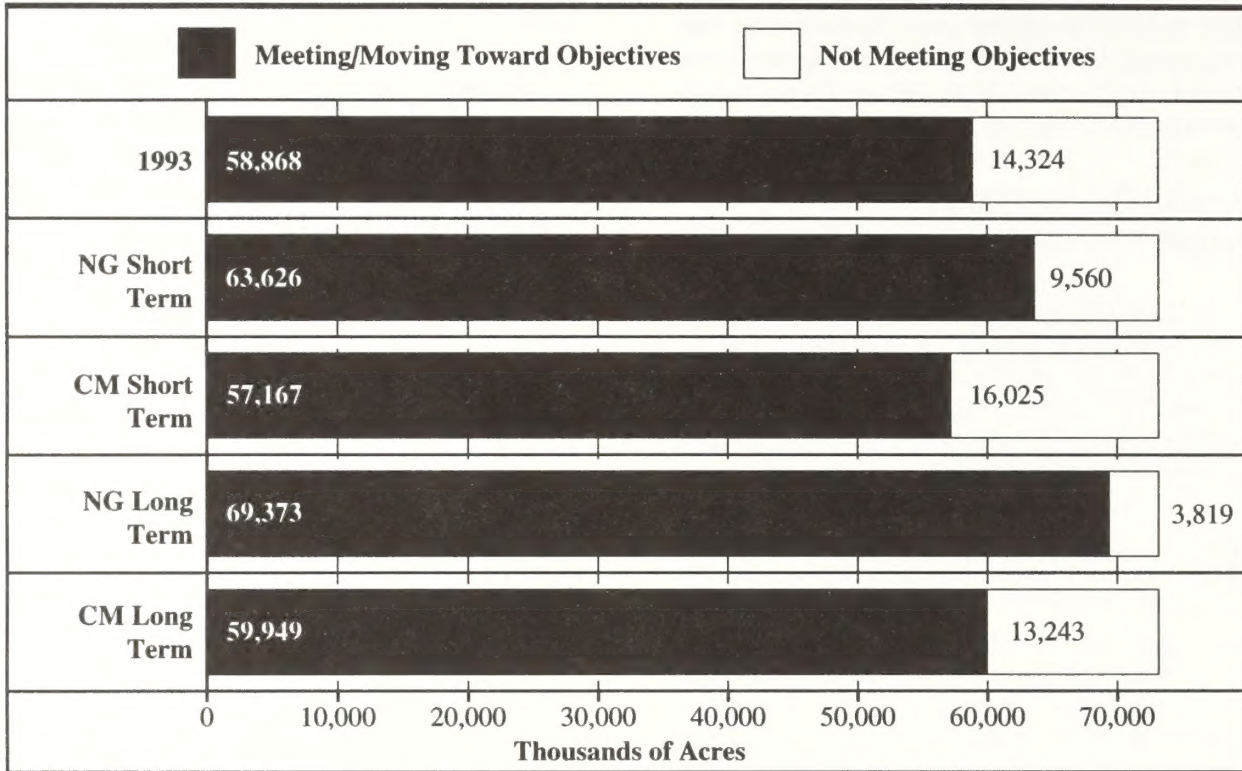
The No Grazing alternative would affect upland vegetation the same as would the Environmental Enhancement alternative for nonfunctioning areas, areas functioning but susceptible to degradation, and areas not meeting management objectives. Removing livestock from federal lands would immediately benefit upland vegetation where conflicts exist with livestock grazing. To the extent that livestock grazing would inhibit or prevent reaching the desired ecological condition, permanent livestock removal would result in better ecosystem health. No Grazing would also have undesirable long-term effects in some upland vegetation zones, especially those that evolved under the grazing pressure of large native herbivores.

Some vegetation zones would not immediately or dramatically improve where fire or climate influences upland vegetation more than livestock. No Grazing would result in little or no change in upland vegetation conditions in shrub- or pinyon-juniper-dominated areas. To significantly change, these areas would need a catalyst to disrupt the dominance of woody





**Figure 4-21: Change in Status - Forest Service Uplands, No Grazing Alternative**



plants. More herbaceous vegetation resulting in more standing litter would increase the potential for wildfire, which might become that catalyst.

### *Sagebrush*

No Grazing would improve grass cover, soil cover, water infiltration rates, and plant vigor and reproduction, as climate and soil potential allow. Communities dominated by woody shrubs would not significantly improve until woody plants were reduced by such means as fire, mechanical treatment, or even livestock. The percent composition of plants would resemble the late seral stage in some but not all areas, because vegetation communities representing *all* seral stages are needed to maintain biodiversity.

In areas having less than 10 inches of annual precipitation sagebrush communities would not significantly improve in 20 years except for nonfunctioning areas whose vegetation is being treated. To support the goals and objectives of biodiversity and ecosystem health, these areas would be seeded with native, diverse plants that normally grow in these areas. Without treatment, trend in the lower precipitation areas

would not significantly change over the long term.

### *Desert Shrub*

In desert shrub vegetation communities livestock removal would improve vegetation, soil cover, water infiltration rates, and plant vigor and reproduction to the extent that climate and soil potential would allow. Desert shrub ecosystems in the drier, hotter areas would increase in grass cover because the climate typically favors grass-dominated rangelands. An increase in grass versus shrubs in these areas depends on seasonal and annual weather variations, regardless of livestock grazing. Where shrubs have become dominant, typically from improper livestock grazing or lack of fire, grass cover would increase slowly or not at all unless the shrubs are controlled mechanically or by fire. Revegetation is a slow process that cannot be induced in areas of low precipitation and high salinity.

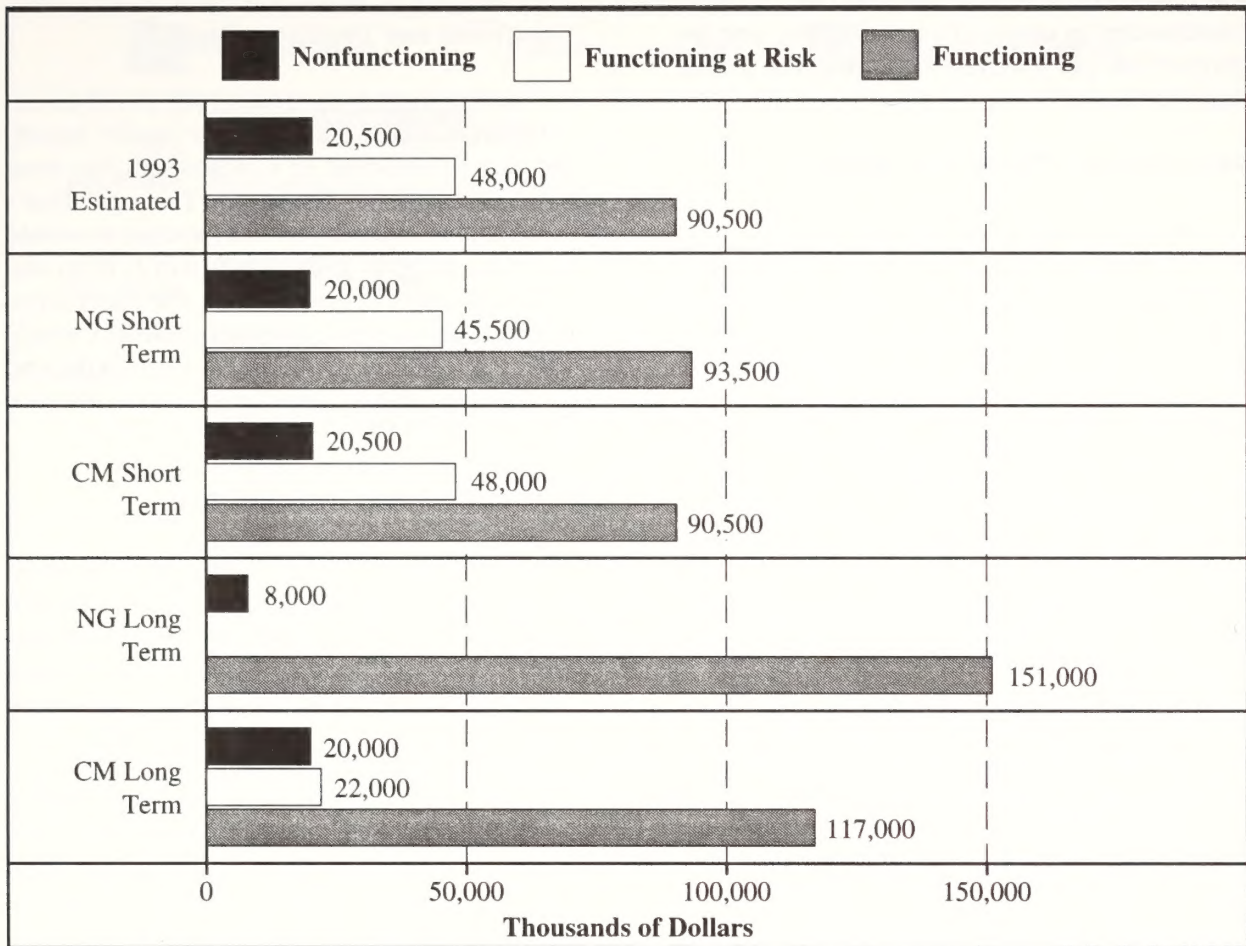
### *Southwest Shrubsteppe*

Eliminating livestock grazing would continue the trend of increasing grass cover. As a





**Figure 4-22: Changes in Functioning Condition - BLM Uplands, No Grazing Alternative**



whole, the shrubsteppe ranges of southern New Mexico and southeast Arizona have been improving in condition since the 1950s drought. The improved condition has consisted mainly of increased grass cover, a result of favorable rainfall and proper livestock management. Although the general trend would be increased grass cover, the response would vary, depending on site characteristics and weather patterns. Sites with harsh growing conditions would not improve much in 20 to 30 years. Without chemical or mechanical control, many sites now dominated by shrubs would continue to be dominated by shrubs (Holechek and others 1989).

**Chaparral-Mountain Shrub**

No Grazing would result in short-term increases in palatable grasses and forbs, grass height and density, vegetative and seed repro-

duction, residual vegetation carried over winter, structural complexity of vegetation, litter and fine organic material at the soil surface, and plant material in the ecosystem as litter and decaying organic material.

A lack of grazing pressure would also cause a rapid short-term increase in understory plants. Bare soil would decrease. Over the long term palatable shrub seedlings and young plants would increase, but the long-term response would depend upon the effect of timber and fire management practices in keeping shrub communities from becoming old and decadent.

**Pinyon-Juniper**

Removing livestock from pinyon-juniper ecosystems would allow the grass and shrub component of the ecosystem to increase in vigor where the pinyon-juniper canopy is not closed. Livestock removal would also reduce soil dis-



turbance to cryptobiotic crusts. Only practices such as prescribed fire and mechanical and chemical treatment, however, would allow biodiversity to return (Doughty 1986), and the pinyon-juniper ecosystem might take a long time to recover.

### ***Mountain and Plateau Grasslands***

Most mountain grassland plant species would rapidly increase in response to a lack of grazing pressure. Bare soil would decrease. The vegetation's structural complexity would increase, as would the plant material in the ecosystem as litter and decaying organic material. Seed and vegetative plant reproduction would increase in the short term. The long-term response would depend on the presence of wildlife and fire to stimulate vegetation succession.

### ***Plains Grasslands***

Their evolution heavily influenced by the grazing of bison, grassland ecosystems would undergo major changes under No Grazing. In the short term, prairie grasses would respond with improved vigor where vigor is low. Where ecological status is at or beyond the mid-seral stage, exclusion of grazing would first result in accumulation of dead material making the grasslands highly susceptible to fire. In the long term, the vigor of grassland species would decline. Frequency of burning would be the main factor influencing vigor and ecological status.

### ***Annual Grasslands***

In the short term, annuals would rapidly increase in response to livestock removal. The vegetation's structural complexity would increase, as would the amount of plant material in the ecosystem as litter and decaying organic matter. Plant reproduction would increase in the short term. The long-term response would depend on how well wildlife and fire would replicate the role of livestock in the maintaining annual grasslands.

### ***Alpine Grasslands***

Removing livestock from alpine ecosystems would increase the vigor of upland vegetation in overgrazed areas. But these ecosystems would

only slowly recover from overgrazing because of cold temperatures and short growing seasons.

### ***Coniferous and Deciduous Forests***

In the short term understory plants in coniferous and deciduous forests would rapidly increase in response to a lack of grazing pressure. Bare soil would decrease. The vegetation's structural complexity would increase, as would the plant material in the ecosystem as litter and decaying organic material. In the short term, seed and vegetative plant reproduction would increase. The long-term response would depend on other influences, most notably fire and timber harvesting.

### ***Riparian/Wetland/Aquatic***

In the long term under No Grazing, 2,191,259 acres (100 percent) of Forest Service riparian areas would either be meeting objectives or moving towards objectives (an increase of 28 percent from 1993) and 672,900 acres (about 65 percent) of BLM riparian areas would be properly functioning (an increase of 91 percent from 1993). Another 289,900 acres (28 percent) would become functioning but susceptible to degradation (a decrease of 38 percent from 1993), and 65,600 acres (6 percent) would be nonfunctioning (a decrease of 68 percent from 1993).

No Grazing would affect 3.2 million acres of riparian areas, resulting in rapid restoration of watershed stability and proper functioning riparian resources. (See Figures 4-23 and 4-24.)

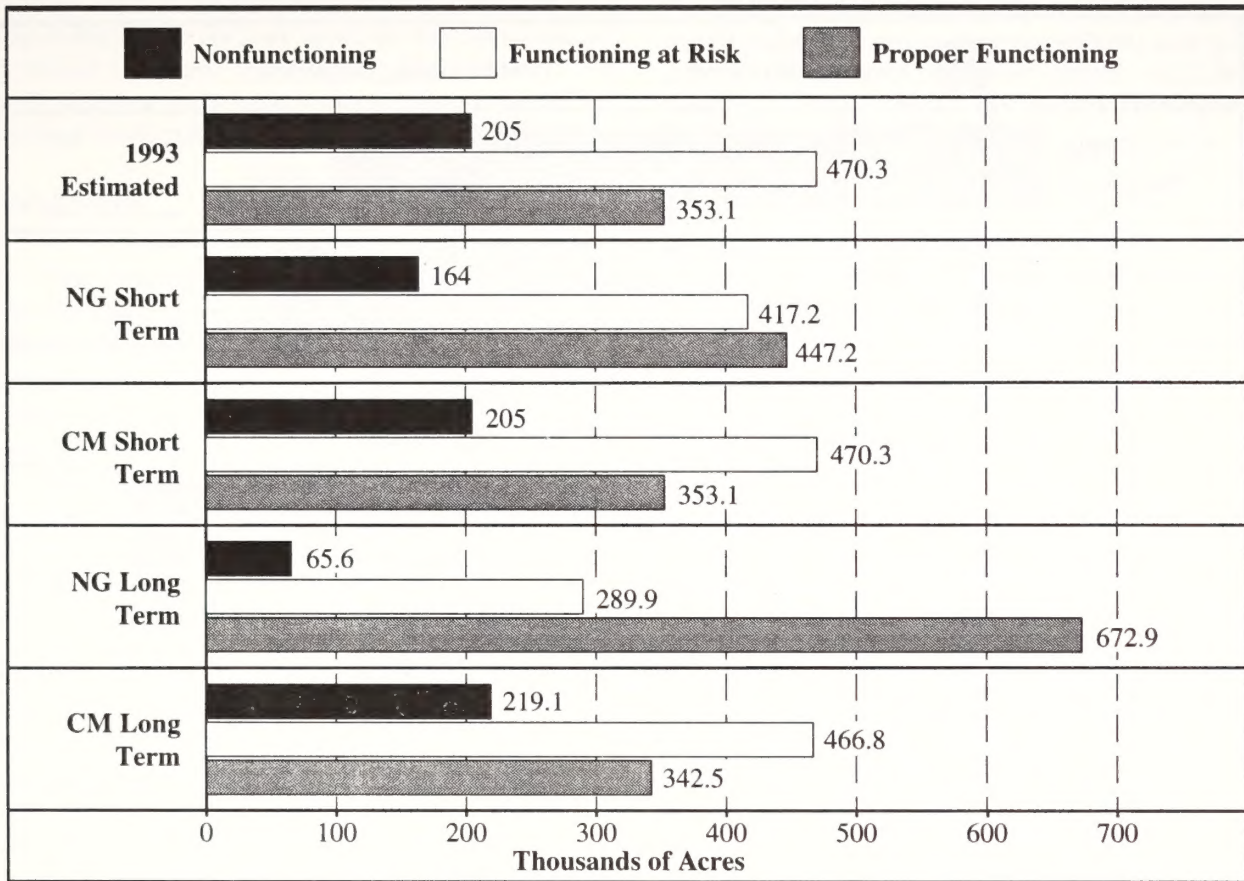
In the short term, meadow plant vigor would rapidly increase in response to livestock removal. The amount of bare soil would decrease. Structural complexity of the vegetation would increase, and the amount of plant material in the ecosystem as litter and decaying organic material would increase. Water infiltration rates would increase in response to increased root production by more vigorous grasses and the increasing density of grasses. Livestock removal should also result in decreased soil compaction and thus increased water infiltration rates.

Vegetation and seed plant reproduction would increase in the short term. The additional litter and standing plant matter would help stabilize the system, be incorporated into the meadow soil-building process, and lead to more





**Figure 4-23: Changes in Functioning Condition - BLM Riparian, No Grazing Alternative**



increases in water storage capacity and plant growth and reproduction. Vigor and reproduction might decline in the long term (perhaps after 10 to 20 years, depending upon climate, water table availability, presence of other ungulates, and current conditions) due to a buildup of vegetation residue preventing sunlight from reaching the lower portions of the plants.

In addition, No Grazing would allow for some riparian-wetland resources historically lost to be restored where a potential for recovery still exists. A large increase in riparian-wetland acreage would be expected in the long term as these areas recover and historic wetted areas are rehydrated.

The No Grazing alternative would approach ecosystem management in the same way as would Current Management and the Proposed Action. In some areas, eliminating livestock grazing would benefit reestablished proper functioning riparian ecosystems. Many methods of vegetation manipulation would be used (except livestock grazing) to maintain vegetation pro-

ductivity and ecosystem health. Management actions would result in the rapid restoration of watershed stability, restoration of riparian areas to proper functioning condition, and strong improvement in biodiversity.

## Watershed

### Upland

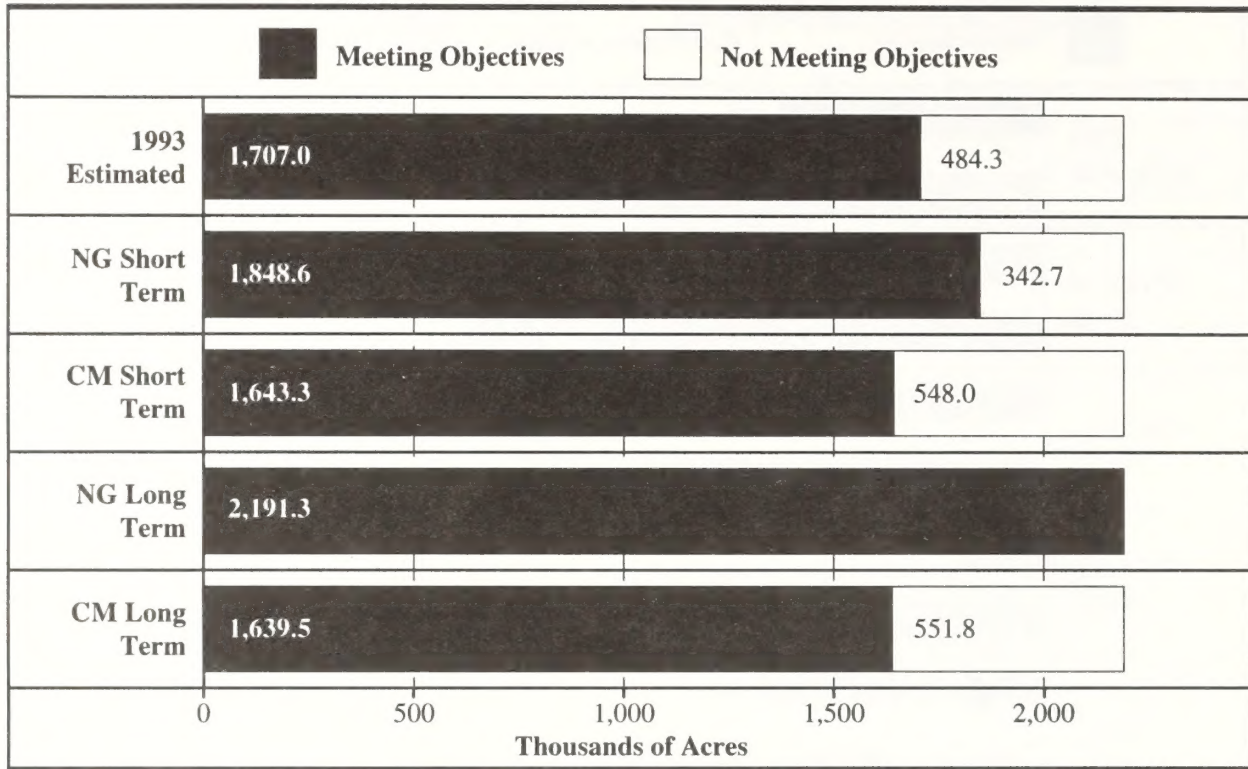
In the short term, until all livestock are removed, vegetation and litter cover would only moderately increase with some improvement in the physical properties of the soil. This change would slightly reduce runoff and erosion rates. Climatic variation would be the dominant short-term agent of change.

In the long term, plant and litter would considerably increase cover, which in turn would improve physical soil properties. Where grazing greatly affects soil, the increase in vegetation and litter cover would greatly reduce the





**Figure 4-24: Change in Status - Forest Service Riparian, No Grazing Alternative**



amount of runoff and erosion within an ecosystem. See Figures 4-21 and 4-22 for short- and long-term changes in upland conditions.

The upland drainage network would improve considerably, with many areas eventually returning to swalelike conditions as gullies revegetate and fill with sediment. The hydrologic response would be a reduction in the size and frequency of floods originating in the uplands.

The desert shrub, pinyon-juniper, and sagebrush communities with less than 10 inches of annual precipitation would respond more slowly to management actions than would other communities.

### Riparian/Wetland/Aquatic

The hydrologic function of essentially all grazed riparian-stream systems would move toward or maintain proper functioning condition. The trend towards proper functioning condition would accelerate faster than under all other alternatives after the 3-year phaseout period when all livestock would be removed from federal lands.

After the 3-year livestock phaseout, the direct disturbance from livestock grazing on riparian areas would end. But the hydrologic damage associated with overgrazed riparian areas would take many years beyond the 3-year phaseout to heal. Some of the slowest riparian-stream systems to achieve proper functioning condition would be lateral or vertically unstable stream channels, especially with low sediment yields or highly fluctuating flows. The 3-year phaseout of livestock grazing would allow limited short-term improvements in riparian areas. Loss of Range Betterment Funds would reduce the agencies' abilities to restore habitats, but the investments would not be essential given the relative speed of natural riparian/aquatic recovery in the absence of livestock grazing.

Over the long term, most riparian-stream systems would achieve properly functioning condition where overbank flooding, water quality maintenance, flood peak reduction, groundwater recharge, and maintenance of low flow would progressively be restored to nonfunctioning riparian areas. (See Figures 4-23 and 4-24.)

Nonpoint-source pollution from livestock would sharply decrease in the short term and



would be eliminated in the long term. Some accelerated sediment and salinity yields would remain beyond the long term in slowly recovering watersheds, such as those in the arid and semiarid Colorado River basin. Fecal bacteria and nutrient enrichment would diminish to natural levels within the short term.

## Wildlife

The upward trend in ecological status under No Grazing would be accompanied by an increase in food, cover, and wildlife populations from late seral stages. Species from early seral stages would experience correspondingly adverse impacts.

Decreased streambank erosion and improved watershed conditions would result in less sediment and turbidity and more aquatic macroinvertebrate production and plant growth providing more food for fish and wildlife.

In riparian areas, immediate short-term improvements in vegetation structure and condition would benefit wildlife. As more riparian areas improve in structure, function, and plant diversity, more forage and cover would allow wildlife populations to expand until competition for riparian resources again limits wildlife numbers. No Grazing would have the same effects on riparian wildlife as would the Environmental Enhancement alternative, with the same concurrent benefits of improved upland habitats.

## Big Game

To maintain biological diversity and natural functioning conditions, the agencies would have to use management tools such as fire and possibly grazing to mimic historic natural conditions. Without such tools, some vegetation communities would grow beyond optimal conditions for many wildlife species, offsetting expected benefits. Big game species associated with vegetation types in low- to mid-seral stages would be significantly harmed by the natural loss of desirable habitat. Fire, mechanical treatments, and livestock would help maintain biodiversity.

## Upland Game and Nongame

The continued developing and implementing of policies for managing rangelands as ecosystems would help improve upland wildlife habitats. With no livestock grazing except where found to be needed to meet management objectives, increased residual vegetation would improve natural vegetation diversity, structure, and ecological condition in uplands. This increased residual vegetation, carried through the winter as food and cover, would increase the numbers and improve the health of associated wildlife. Over the long term, upland wildlife numbers would greatly increase.

## Waterfowl

Improved riparian condition would improve nesting waterfowl habitat, nesting success, and the quality of migration and wintering habitat on lands administered by both agencies. Expected waterfowl population increases would also depend on what happens on other waterfowl habitat segments next to federally administered lands. If these areas are more heavily grazed by livestock than before, overall waterfowl population increases might be limited.

## Raptors

Under No Grazing, increases in vegetation biomass, structural diversity, litter, and food supply for prey species would improve habitat conditions for raptors. Riparian-wetlands would improve most rapidly. Some raptors might decline in response to reductions in prey species that prefer earlier seral stages. Upland vegetation would improve somewhat slower depending on rainfall and soil productivity.

## Resident and Anadromous Fish

Removing livestock from riparian areas would quickly improve riparian vegetation habitats. As streambanks and channels are rebuilt, beaver would take on a more significant ecological role. Rising water tables would greatly expand riparian conditions beyond the acreage on which they occur today. Fisheries habitat would increase or improve. Most aquatic habitats would have upward trends. Of all alterna-



tives, No Grazing would best protect anadromous fisheries habitats from the harm of live-stock grazing. About 75 percent of degraded rangeland anadromous fish habitat would be restored over the long term.

Fisheries scientists have concluded that restoring riparian/aquatic habitats is the most compatible grazing strategy for fisheries resources (Platts 1991). Over time, anadromous fish populations would stabilize or even increase, but only if other serious problems can be resolved: overfishing, migration route blockage, increased predation on young fish, competition with non-native fish, combined effects of interbreeding with hatchery fish, and increased isolation and fragmentation of suitable spawning habitats.

## Special Status Species

With vegetation changes and increased cover, forage, plant growth, and regeneration, No Grazing would result in short- and long-term trends toward the recovery of many sensitive and listed species. Except from wildlife and wild horses and burros, direct impacts such as trampling and grazing would cease. In addition to benefits from reduction of direct take of species, populations would have increased vigor, which should parallel improvement in ecological condition.

No Grazing would result in an accelerated move toward plant community characteristics and ecosystem processes preferred by riparian and aquatic species. Since most special status species are riparian dependent for some part of their ecology, as riparian and aquatic ecosystems improve, special status species populations should increase accordingly. Change toward habitat characteristics preferred by upland species would proceed at a moderate rate, paralleling improvements in upland vegetation.

In the very long term, removing livestock from vegetation that developed under large-ungulate grazing, such as in the plains and mountain and plateau grasslands, could cause natural ecosystem processes to stagnate. In such cases, some large-ungulate grazing may be required to maintain these processes. Although species may continue to be listed in the future, no special status species are likely to be federally listed in the long term as a result of ongoing grazing impacts.

Range improvements needed for the maintenance, restoration, and recovery of special status species would be maintained. The loss of Range Betterment Funds used for restoring special status species habitat would continue the downward trend toward habitat loss for some species in local areas, but this impact would not be significant nationally.

## Wild Horses and Burros

Improved upland and riparian vegetation would improve habitat conditions for wild horses and burros where they compete with live-stock.

The No Grazing alternative would remove range improvements that block wild horse and burro movement or migration. The loss of range improvements critical to wild horses and burros would harm these animals in the short term until BLM and the Forest Service develop budget and management processes for building improvements to meet horse and burro needs. Publicly owned water developments and fences in herd management areas would be built to protect riparian and other sensitive areas.

## Recreation

The No Grazing alternative would affect developed recreation sites much as would the Environmental Enhancement alternative. But No Grazing would offer the greatest opportunities for developing new facilities by eliminating livestock-recreation conflicts.

No Grazing would also improve conditions in undeveloped recreation sites, quickly ridding preferred sites of livestock disturbances. Removing unneeded range improvements, especially fences, would take longer in backcountry or remote areas. In the long term, however, undeveloped sites would less deteriorate because of decreased erosion, increased vegetation cover, and no livestock trampling. All undeveloped sites would be protected from authorized livestock grazing in upland and riparian settings as compared to few sites that are now protected.

Eliminating grazing and range projects would improve riparian and upland scenic quality in the short and long term. (See Figures 4-21, 4-22, 4-23, and 4-24.) Within a relatively short period (depending on the response or recovery of local vegetation), plant communities



would establish a more natural appearance, and fence-line contrasts would become largely unnoticeable. The most obvious long- and short-term improvement in scenic quality would result from eliminating grazing facilities that do not enhance other resources. The long-term result would be scenic quality markedly different from existing conditions.

Under No Grazing, motorized and nonmotorized users would enjoy relatively unimpeded movement across public lands. But access in well-vegetated areas like willow-lined riparian zones would become more difficult as plant communities respond to the removal of livestock. Moreover, No Grazing would not improve access to public lands since crossing private land would become more difficult because of shifts in attitudes of some landowners.

Having somewhat differing expectations from nonmotorized users, motorized users would enjoy federal lands more than would nonmotorized users. Removing interior fences would increase freedom of movement and hence the quality of the user experience.

Improved conditions for fish and wildlife would mean higher quality wildlife-related recreation. Improved riparian conditions would extend seasons and increase the number and quality of opportunities for water contact such as swimming. Improved water quality would also reduce health risks for these users.

Guides and outfitters would benefit more from No Grazing than from any other alternative. Recreation services would become more marketable as resource and user conditions improve, opening more opportunities for recreation users. More boundary fences, however, would restrict freedom of movement. Improved riparian and aquatic conditions particularly would increase opportunities (longer seasons, more miles of usable streams) and the quality of existing opportunities. This trend would start by the end of the short term and continue through the long term. Removing livestock and range management facilities would reduce planning conflicts and impediments to special events.

## Wilderness

No Grazing would affect wilderness values much as would the Environmental Enhancement alternative except that No Grazing would remove

livestock from almost 7 million more acres of wilderness study areas not recommended for designation. All wilderness values on these areas would improve.

## Cultural and Paleontological Resources

The No Grazing alternative would eliminate damage to cultural resources from livestock trampling. But historic properties of the western ranching lifeway would not be maintained, would deteriorate, and would be lost in the long term. Traditional ranching lifeway values would slowly disappear.

Compared to Current Management, No Grazing would increase effects on cultural resources in the short term but decrease them in the long term by removing cattle, sheep, and range management facilities.

## Economic Conditions

No Grazing might accelerate ongoing trends in the agricultural industry in the West and trends in many rural western communities. (These trends are discussed in Chapter 3.) The extent of the impacts would depend on how dependent communities are on livestock production on federally-administered lands and alternatives open to livestock operators. About 22 percent of beef cattle producers in the 11 western states would be affected and about 19 percent of the sheep producers. The ability of these producers to maintain their operations would greatly vary. Many producers completely depend on federal forage; others have low dependency. The following narrative describes ongoing trends and emerging issues that may further affect the ability of livestock operators to obtain suitable alternatives to federal forage.

Population growth and demographic changes in the West and in many western rural communities will continue to transform rural economies. Population growth in many rural communities, while contributing to economic growth and diversification, will continue to diminish the relative importance of agriculture in those communities. But economic diversification also offers more opportunities to earn off-ranch income and help families maintain their ranches. Communities that continue to



lose population and whose economies are in decline may be further strained under the No Grazing alternative.

Land use changes, such as increased recreation use and subdivision of privately owned ranchlands, are both a cause and a result of trends in agriculture. Economically marginal ranches may be encouraged to sell to developers where rural homesites are in increasing demand, resulting in further decline in agriculture. Increased outfitter and guide activities, which encourage more recreational use of rural areas and offer more income-earning potential to ranch operations, may contribute to population growth and may in turn accelerate changes in land use away from agriculture.

Land use changes could affect community tax bases. The impact to a local economy of a change in livestock production depends on the relative size and growth trends in other sectors of that economy. Where a relatively significant livestock industry declines, tax revenues have a high probability of declining. On the other hand, where other sectors of the economy are stable or growing and a relatively small decline occurs within a large livestock industry (or a large decline occurs within a small livestock industry), major impacts to the tax base are unlikely.

Changes in land use may accelerate the decline in public access to public lands where access depends on crossing private lands. Reduced access may increase the demand for land adjustment (such as land exchanges or easement acquisition) by BLM and the Forest Service to obtain more access to public lands.

Policies aimed at recovery of endangered species, such as desert tortoises, anadromous fish, and grey wolves, would continue to affect livestock production on private lands where livestock operators receive federal funding (for conservation programs administered by the U.S. Department of Agriculture, for example). But future activities designed to avert habitat loss and endangered species listings may help sustain livestock production in the long term.

Eliminating the Federal Government's wool subsidy program over the next 3 years could accelerate the decline in sheep production in the West and may cause marginal sheep producers to sell their operations. Other government policies, such as trade agreements aimed at reducing international trade barriers, will also continue to affect the industry. Agreements of this

kind may both increase and decrease livestock production, but the direction and magnitude of these impacts is beyond the scope of this EIS. The expiring of Conservation Reserve Program contracts beginning in 1996 might encourage the use of croplands for pasture, thereby increasing forage for livestock.

The most important direct and indirect economic effects that will result from implementing No Grazing are discussed in the following sections.

## Regional Economic Impacts

Under No Grazing, livestock grazing would be phased out on public lands over a 3-year period, thus reducing federal forage for livestock grazing to near zero. Under this alternative, employment and income impacts would result only from eliminating forage, not from raising grazing fees.

The No Grazing alternative would cause an estimated reduction of about 1.2 million cattle and about 817,000 sheep nationwide. This estimate assumes a 25 percent average feed dependency for cattle operations and a 35 percent average feed dependency for sheep operations (see Table 4-13).

The 1.2 million cattle coming off federal land represent about 2 percent of the estimated range-cattle inventory in the lower 48 states, about 4 percent in the 16 western states, and about 9 percent in the 11 western states. (See Appendix R, U.S. Cattle Inventory for Range Cattle Inventory Estimates by State.) The 817,000 sheep represent about 8 percent of the sheep inventory in the lower 48 states, 13 percent in the 16 western states, and 16 percent in the 11 western states.

The cattle and sheep coming off federal lands would go to market or would be moved to other areas or regions. Several alternative forage sources exist (Acreage Reduction Program acres and other farm program acres during allowable periods) or could potentially exist (Conservation Reserve Program acres when they come out from under contract, beginning in 1996) in other regions.

Assuming complete implementation of No Grazing, employment would decline by 18,300 jobs in agriculture and related industries. This amount represents about 1 percent of the total 1990 agricultural employment of 1.5 million. Although the decline in employment would be





**Table 4-13: Method for Estimating Reductions in Cattle and Sheep Inventory Under the No Grazing Alternative**

Total # of federal AUMs:	16,340,000 <sup>1</sup>	
# of cattle AUMs (88 percent): <sup>2</sup>	14,379,200	
# of sheep AUMs (12 percent): <sup>2</sup>	1,960,800	
Average dependency: <sup>3</sup>		
Cattle operators:	25 percent	
Sheep operators:	35 percent	
<b>Cattle: Estimated Reduction</b>		
$\frac{14,379,000 \text{ AUMs}}{0.25 \text{ dependency}} = 57,516,000 \text{ AUMs}$	=	total federal and nonfederal AUMs needed to support cattle currently grazing on public lands
$\frac{57,516,000 \text{ AUMs}}{12 \text{ months}} = 4,793,000 \text{ cattle}$	=	number of cattle supported by 57.6 million AUMs (also represents number of cattle that spend, on average, 25 percent of their time on public land)
$4,793,000 \times 0.25 = 1,198,000 \text{ cattle}$	=	estimated number of cattle eliminated under No Grazing alternative
<b>Sheep: Estimated Reduction</b>		
$\frac{1,961,000 \text{ AUMs}}{0.35 \text{ dependency}} = 5,603,000 \text{ AUMs}$	=	total federal and nonfederal AUMs needed to support sheep now grazing on public lands
$\frac{5,603,000 \times 5}{12 \text{ months}} = 2,333,000 \text{ sheep}$	=	Number of sheep supported by 5.6 million AUMs (also represents number of sheep that spend, on average, 35 percent of their time on public land)
$2,333,000 \times 0.35 = 816,550 \text{ sheep}$	=	estimated number of sheep eliminated under No Grazing alternative
<sup>1</sup> See Appendix J, 3-Yr Average AUMs Authorized. <sup>2</sup> Source: Forest Service 1993a; BLM 1993d. <sup>3</sup> See Table 3-17, Dependency Levels for Permitted Herds in 13 Western States.		

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felt mainly in agriculture, total job losses would be spread throughout many sectors of the economy. In that context, employment losses would represent less than 0.1 percent of total westwide employment.

Total income would decrease by \$737.1 million in agriculture and related industries. This loss represents 2.4 percent of total agricultural income westwide and 0.5 percent of total income in all sectors westwide (Forest Service 1993g). In relation to gross receipts for cattle and sheep of \$24.4 billion in 1990 (Strickland,

Johnson, and Williams 1991), the loss in total income represents about 3.3 percent.

Economic impacts under No Grazing would be greater than under any other alternative. Because No Grazing would be phased in over 3 years, impacts to employment and income would be greatest in the short term.

As under the other alternatives, employment and income impacts would be minor relative to the total westwide (17 western states) economy. In the agriculture industry, impacts would be relatively greater. But in the long term, contin-



ued growth of employment and income in other industries would tend to offset the employment and income reductions resulting from eliminating livestock grazing on federal lands.

Local economies could be significantly affected, depending on several factors: the amount of public land in the region, the dependency on federal forage in the region, the size of operations, and operator responses to eliminating livestock grazing. Areas relatively more dependent on federal forage, such as in the Desert Southwest with an average 60 percent dependency, would be more affected. Where dependency on federal forage is lower, such as in Montana where the average dependency is 11 percent, impacts would not be as significant.

The effect of No Grazing on red-meat prices would be slight. In the near term, selling off sheep and cattle herds would lower prices as more livestock are slaughtered. But a 1 percent decrease in the national cattle inventory would result in about a 1 percent increase in retail beef prices after the near-term effects worked themselves through. The current increase in the national cattle inventory (an expected 1 percent in 1993) would depress cattle prices. Thus, the general increase in the national cattle inventory would offset the effect of livestock liquidation.

Under No Grazing, improved resource conditions in the long term would create economic benefits that would offset some of the declines in employment and income. These offsetting impacts would be greater under No Grazing than under any other alternative. Greatly improved wildlife and fisheries habitat and recreation site improvements would increase employment and income as hunting, fishing, and wildlife viewing opportunities increase.

## Ranch Income and Operation Impacts

This section describes the impacts to ranch operations and ranch income resulting from elimination of livestock grazing on BLM- and Forest Service-administered lands. Impacts are described for three hypothetical herd sizes: 425 cows, 210 cows, and 90 cows. Impacts are also considered for two levels of federal forage dependency for each of these three operations: 60 percent and 30 percent. Appendix O, Changes in Ranch Returns from Reduced AUMs and Higher Grazing Fees, describes the methodology used to assess the impacts to ranch operations.

Under No Grazing, the supply of federal forage would decrease by 100 percent after a phase-in period. Two variables influencing how ranches losing BLM-Forest Service forage would be affected are dependency on this federal forage and herd size. Table 4-14 shows estimated losses in net cash returns to the six hypothetical operations as a result of eliminating federal forage. These losses are expressed both as reduced herd sizes and decreased net cash returns (net receipts minus expenses).

In this analysis, the impact would be greatest for a herd size of 425 cows and a 60 percent dependency on federal forage. Herd size would decrease by 265 cows, and net cash returns would decrease by \$22,800. For the smallest operation, 90 cows and 30 percent dependency, herd size would decrease by 28 and net cash returns would decrease by \$2,400.

Although the main adjustment permittees would make to the elimination of BLM and Forest Service forage would be to decrease their herd

**Table 4-14:** Impacts to Ranch Operations under the No Grazing Alternative

Herd Size	% Dependency on Federal Forage	% Cut in AUMs	# Of Cows Lost per Permitted Herd	Net Cash Returns Lost Due to Smaller Herd Size
425	60.0	100	265.2	\$22,807
425	30.0	100	132.6	11,404
210	60.0	100	131.0	11,266
210	30.0	100	65.5	5,633
90	60.0	100	56.2	4,833
90	30.0	100	28.1	2,417



sizes, permittees might respond in other ways: substituting other forage (leasing more private pasture), using supplemental feed (hay), increasing the productivity of private lands (pushing ditches further up the sideslopes or installing wells and center pivot sprinkler systems to increase vegetation on private property), or encouraging federal agencies and state game officials to install wildlife bait stations to keep elk and deer in the uplands to reduce competition for forage. These responses would somewhat offset losses of federal forage.

The greatest impacts would fall on permittees most highly dependent on federal forage to meet their total feed requirements. The impact of the reductions would vary with the financial condition of the ranch and the level of dependency. Unprofitable ranches would be further stressed and might be forced to sell the operation. Even profitable operations might be forced to sell out if they were highly dependent on federal forage.

The effect would also depend on an operator's flexibility in finding and purchasing more forage. Ranches with the fewest alternatives and least flexibility would reduce their livestock the most in response to higher fees and less forage. Even ranches that do not greatly depend on federal forage would be stressed by reductions if they cannot find affordable alternative forage.

## Grazing Fee Receipt and Payment Impacts

No Grazing would eliminate grazing fee receipts, resulting in a \$30.8 million overall decline. Range Betterment Funds would decrease by \$15.4 million, payments to states and counties would decline by \$6 million, and revenues to the U.S. Treasury would decline by \$9.4 million. Table 4-15 shows the estimated decreases by category and agency.

## Social Conditions

### Permittees

Under No Grazing, the losses in income experienced by the average permittee (with a herd size of 210 cows and a 30 percent dependency rate) would be \$5,633 annually. Some permittees would have greater losses than the average.

Others would have smaller losses. The size of the loss for any permittee would depend on the size of the operation and the dependency on federal forage. The effect of the loss on any individual permittee would vary by the size of the loss, the financial condition of the operation, and the dependence of the ranch family on the operation.

Under No Grazing, losses in income would be greater than for all other alternatives. Permittees would also be concerned about how the loss of permits would reduce the value of ranches. These losses in ranch income would result in declines in the economic well-being of many permittees and their families. Lifestyle changes in response to the income loss would include families decreasing their spending, diversifying operations to make them less dependent upon ranching, or sending family members to work off the ranch to bring in more income. Economically marginal ranches may be

**Table 4-15:** Change in Grazing Fee Receipts under the No Grazing Alternative (1993 \$)

Range Betterment Funds	(\$15,389,000)
BLM	(\$ 9,465,000)
Forest Service	(\$ 5,924,000)
Payments to States and Counties	(\$ 5,997,000)
BLM	(\$ 3,322,000)
Forest Service	(\$ 2,675,000)
Revenues to U.S. Treasury	(\$ 9,393,000)
BLM	(\$ 6,144,000)
Forest Service	(\$ 3,249,000)
Total	(\$30,778,000)
BLM	(\$18,931,000)
Forest Service	(\$11,847,000)
BLM	(\$18,931,000)
Range Betterment Funds	(\$ 9,465,000)
Payments to States and Counties	(\$ 3,322,000)
Revenues to U.S. Treasury	(\$ 6,144,000)
Forest Service	(\$11,847,000)
Range Betterment Funds	(\$ 5,924,000)
Payments to States and Counties	(\$ 2,675,000)
Revenues to U.S. Treasury	(\$ 3,249,000)
Due to rounding, numbers may not add up to totals.	



encouraged to sell, either to other ranchers or to developers in regions where demand for rural homesites is increasing. Most permittees would try to adjust their operations to absorb the income losses rather than sell their ranches because maintaining the ranching lifestyle is important to them. But under No Grazing, some operations could no longer stay in business.

The social impacts to permittees, ranch families, and ranch employees would be far reaching and most severe under No Grazing. Although economic loss contributes significantly to social stress, possibly of equal importance is the disruption of traditional lifestyles, attitudes, and beliefs. Personal characteristics of self-sufficiency, independence, hard work, and other traits associated with the ranching lifestyle would be deeply shaken for many permittees. The average rancher is 55 years old; it would be difficult for many who lose their ranches to obtain other suitable employment. The social consequences discussed in the Impacts Common to All Alternatives section of Chapter 4 would be accelerated under No Grazing.

For ranching community residents No Grazing would intensify feelings of mistrust and loss of personal control and further threaten lifestyles, resulting in highly negative attitudes toward BLM, the Forest Service, and the Federal Government in general. Interactions with other public land users would continue to be stressful for the ranching community. Currently, in some areas, ranchers and other interest groups are working together toward mutually beneficial land management goals. No Grazing would make the tasks of such groups more difficult.

Some permittees would close off access to their base property and any access they control to public land to exert some control over their land.

## Counties and Communities

Westwide in the short and long term under No Grazing, 18,300 jobs would be lost. These losses represent jobs in all sectors of the economy—ranch employment as well as jobs directly and indirectly related to ranching. Many more jobs would be lost than under the Environmental Enhancement alternative. Job losses, however, would be insignificant at the westwide level. Moreover, some of the decline in employment would be absorbed through retirements

and people seeking other types of work in the normal course of their lives.

The effects of the No Grazing alternative would include the outmigration of some permittee families whose operations or businesses could not support them. Families dependent upon local businesses, particularly agricultural supply and retail stores, could also be affected. The level of outmigration would depend on the financial condition of the permittees, their job skills, and employment opportunities in the local area. The social impacts to permittees and their families, ranch employees, and related business would be far reaching and most severe under No Grazing.

“Typical small communities” (as described in Chapter 3) are most likely to be affected under No Grazing because they are currently losing population and they have a lower capacity to respond to change. In other areas, such as Gunnison County, Colorado, population declines from permittee family outmigration might be offset by people moving into the area as part of the rural development trend. New people might have different attitudes and values than the people leaving the area and would probably place less importance on the traditional values of ranching families. The potential effects of job and population loss on local communities are described in the Social Conditions discussion in the Impacts Common to All Alternatives section at the beginning of Chapter 4.

In some communities such as Rawlins, Wyoming, residents believe that ranching is an important part of their community and lifestyle. Residents would be highly concerned about the change in emphasis away from livestock management and would strongly resent any alternative that removed livestock grazing from federal lands. No Grazing would improve recreation quality, but local recreationists and those promoting recreation as a way to diversify the local economy would probably not favor this alternative because of its potential to harm to permittees and the community.

Residents would tend to attribute any sale of a permittee's operation to elimination of livestock grazing on federal lands, even if the sale resulted from other factors. Residents and permittees would probably also feel increased resentment and distrust toward the Federal Government and federal agencies because of reduced local control over the management of public



lands. Such feelings would make future cooperation between many local people and BLM and the Forest Service extremely difficult, even in the long term.

Where rural areas are being developed, ranchers and some newcomers are concerned that Rangeland Reform '94 will accelerate urbanization.

In areas where the population is more diverse, such as Gunnison, Colorado, No Grazing may appeal to some newcomers and people interested in tourism, and to some environmental and recreation groups. But recreationists and environmentalists who fear loss of recreation access and open space due to development would be reluctant to support No Grazing. Differences in opinions and values among community groups could result in less cooperation and support among groups within these communities under No Grazing.

## National Impacts

Increasing numbers of people in the West and across the country believe that rangeland

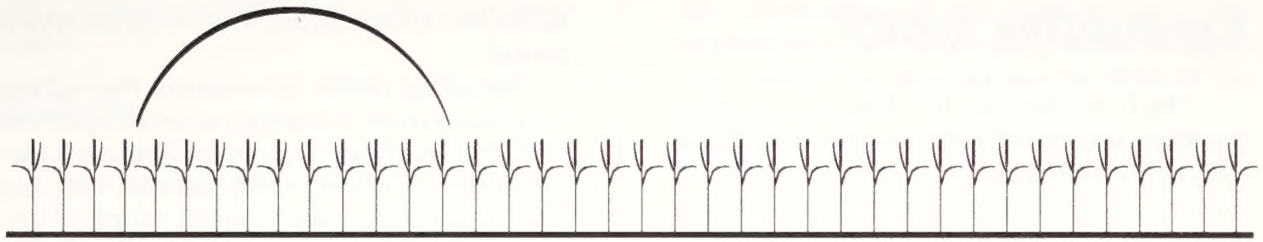
management should emphasize protecting rangeland resources rather than managing livestock. Most people also support agricultural use of the land. Some people may feel that No Grazing is necessary to protect riparian and wildlife resources. Most people, however, would believe that No Grazing is too restrictive in removing all livestock from federal lands. People who favor this alternative would feel satisfied about government in general, BLM and the Forest Service, and the policymaking process.

Some recreationists and environmentalist believe that livestock grazing should be prohibited on public lands. Others feel that No Grazing is too restrictive. The condition of these resources is important to these groups because they see them as potential recreation areas and because many appreciate just knowing that these areas exist and will continue to exist in the future. Generally, people living close to the affected communities would support the livestock industry more than those living further away.









# CHAPTER 5

## Consultation and Coordination

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## Cooperating Agency

The Forest Service, U.S. Department of Agriculture, was a cooperating agency in the preparation of this draft EIS.

## Consultation

During preparation of the draft EIS, BLM and the Forest Service consulted informally with the Fish and Wildlife Service and National Marine Fisheries Service under Section 7 of the Endangered Species Act. Formal consultation will be initiated when a final alternative is selected. More detailed consultation may be needed on a case-by-case basis when the selected alternative is implemented. Implementation actions would be evaluated to determine if they may affect federally listed threatened or endangered (T&E) species, species proposed for listing, or designated or proposed T&E critical habitats. Before implementing actions that may affect listed or proposed species, the agencies will consult with the Fish and Wildlife Service or the National Marine Fisheries Service as required by Section 7 of the Endangered Species Act. When appropriate, BLM and the Forest Service will conduct this consultation using an ecosystem or species rangewide approach.

Before authorizing surface disturbance undertakings at the regional or local level, BLM and the Forest Service will identify cultural properties eligible for inclusion in the National Register of Historic Places and consider the effects of the proposed undertakings through the consultation process in Section 106 of the National Historic Preservation Act of 1966.

## Public Participation

The EIS public participation process consists of several phases. Public participation begins with scoping, which is conducted to help identify issues and alternatives before any decisions are made. Information gathered during scoping is analyzed and used in determining the issues to be addressed and the alternatives to be presented in detail in a draft EIS.

A draft EIS is subject to further public review and comment during the public comment period. Following the comment period, a final EIS is developed. The final EIS incorporates any

additional comments received during the review period.

Including public involvement throughout the process ensures that the process is open and considers information from all interested parties, including other federal agencies, state and local government, the scientific community, professional organizations, a variety of public land users, conservation organizations, and citizens at large.

With respect to rangeland reform, public participation opportunities have so far included five grazing town hall public meetings, a 60-day comment period on the BLM and Forest Service advance notices of proposed rulemaking, and a 70-day scoping period for the draft EIS. Further opportunities include the current public comment periods for the draft EIS and for the BLM and Forest Service proposed rulemakings.

## Grazing Town Hall Meetings

During the spring and summer of 1993, Secretary of the Interior Bruce Babbitt conducted the following public meetings in the West to obtain public views on the grazing program:

April 30	Bozeman, MT
May 1	Reno, NV
May 5	Grand Junction, CO
May 6	Albuquerque, NM
July 9	Flagstaff, AZ

Representatives from the Department of Agriculture, including the Forest Service, accompanied the Secretary at these meetings. Thousands of people attended. More than 300 members of the public testified, and more than 1,300 people submitted letters and comment sheets during or after the meetings. Discussions centered on the importance of protecting and restoring the condition of the public rangeland, the fate of the current grazing fee and formula, and the economic importance of public resources to rural communities.

Although these meetings were not part of the formal scoping process for the Rangeland Reform '94 Draft EIS, BLM and the Forest Service considered the views expressed at these meetings and in later correspondence while developing the rangeland reform initiative and the draft EIS. (For further information, see Appen-



dix S, Summary of 1993 Grazing Town Hall Meetings.)

## Scoping

An extensive public scoping process was conducted for the Rangeland Reform '94 Draft EIS. A notice of intent to prepare the EIS and to invite public comments and suggestions on the scope of the analysis was published in the July 13, 1993, *Federal Register*. The scoping period was reopened for 30 more days through an August 13, 1993, *Federal Register* notice, and then for 30 more days through a September 20, 1993, *Federal Register* notice. Concurrently, BLM and the Forest Service each published an advance notice of proposed rulemaking in the August 13, 1993, *Federal Register*. These notices provided a 30-day comment period, which was extended by 30 days in the September 20, 1993, *Federal Register*.

News releases were issued nationwide at the same time that the *Federal Register* notices were published in July, August, and September. Beginning in August, informational packages on rangeland reform were provided to permittees, interest groups, state and local governments, congressional offices, and Native American groups. When requested, briefings were provided to entities such as local and state governments, grazing advisory boards, industry associations, and environmental and recreation groups.

More than 12,600 pieces of mail were received from July 13 through October 20, 1993. Of these, more than a third were duplicates (letters sent by the same party more than once or to more than one government entity). Comment letters were sent to Secretary of the Interior Bruce Babbitt; Secretary of Agriculture Mike Espy; BLM Director Jim Baca; Michael J. Penfold, BLM's Assistant Director for Land and Renewable Resources; the Director, Range Management Staff, Forest Service; and members of Congress.

A BLM-Forest Service comment analysis team was established to review the comment letters. Each letter was identified by a six-part code showing its sequential number, affiliation (organizations and industry, individuals, government), state of origin, number of signatures, type of letter (original letter or post card, form letter, modified form letter, petition, or resolution), and the agencies to whom the letter was

sent. Each comment was coded to one of 156 distinct fields, each of which represents a unique idea, alternative, issue, or specific level of detail.

Comments were captured in a relational data base that allows retrieval individually or in myriad combinations. After identifying and filing duplicate letters, the comment analysis team recorded more than 56,000 comments from more than 8,000 letters. The results of comment analysis were given to the EIS team. Letters postmarked after October 20, 1993, were reviewed for unique ideas and also given to the EIS team. To support data in the computer, all original letters and analyzed copies of letters have been kept on file in sequential order.

Issues, concerns, and alternatives identified during the scoping process are discussed in Chapter 1.

## Distribution of the Draft EIS

The impacts of BLM's and the Forest Service proposed rules and alternatives are analyzed in the draft EIS, which been released for public review and comment during a 90-day public comment period. Copies of the draft EIS have been sent to federal agencies, state and local governments, livestock operators and companies, environmental organizations, and many people concerned about the outcome of the rangeland reform process. Correspondence generated by the grazing town meetings, EIS scoping, and BLM and Forest Service advance notices of proposed rulemakings was used to develop a basic mailing list; one copy of the draft EIS was sent to each address

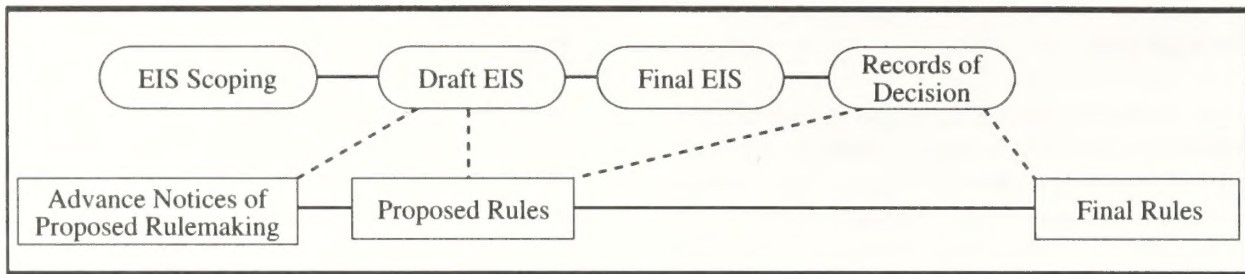
## Additional Actions

The final EIS will incorporate comments and changes resulting from the public comment period. No sooner than 30 days after publication of the final EIS, the Secretaries of the Interior and Agriculture will issue separate records of decisions for their respective rangeland management reforms, including a grazing fee formula. At the same time, on the basis of these records of decision, each agency will publish final rules in the *Federal Register*. See Figure 5-1 for the general steps in the EIS and rulemaking process.





**Figure 5-1: The Administrative Process**



The decisions resulting from the analysis in the draft and final EISs may be implemented in a variety of ways. See the Implementation section in Chapter 2 for further discussion.

### List of Preparers

The following people participated in the Rangeland Reform '94 effort.

- Alexander, Bob      Range Conservationist  
BLM (NMSO)  
B.S., Range Science  
(New Mexico State University)
  
- Allen, Bob          Range Conservationist,  
BLM (NVSO)  
M.S., Public  
Administration  
(Utah State University)  
B.S., Range  
(Brigham-Young University)
  
- Alward, Greg        Economist, Forest Service  
(WO)  
Ph.D., Forest Economics  
(Colorado State University)
  
- Amen, Alan          Soil Scientist, BLM (SC)  
B.S., General Agronomy  
(Colorado A&M University)

- Apple, Larry L.      Wildlife Biologist, BLM  
(Rawlins DO)  
B.S., Fisheries and  
Wildlife Biology  
(Iowa State University)  
B.A., Business  
Administration  
(University of Iowa)
  
- Archer, Scott F.    Air Resource Specialist,  
BLM (SC)  
B.S., Chemistry and  
Environmental Science  
(Northern Arizona University)
  
- Athearn, Frederick   Historian, BLM (COSO)  
Ph.D., History  
(University of Texas)  
M.A., History  
(St. Louis University)  
B.A., History  
(University of Colorado)
  
- Barker, Pat          Archaeologist, BLM  
(NVSO)  
Ph.D., Anthropology  
(University of California -  
Riverside)  
M.A., Anthropology  
(University of California -  
Riverside)  
B.A., Anthropology  
(Cal State University -  
Long Beach)



Barkow, Lee Acting Associate Director, BLM (SC)  
M.S., Plant and Soil Science (Southern Illinois University)  
B.S., Forestry/Recreation (Southern Illinois University)

Barrett, Hugh Range Conservationist, BLM (ORSO)  
B.S., Range Management (Humboldt State College)

Bays, Dale Economist, BLM (ORSO)  
B.S., Forestry (State University of New York)

Bellinger, Melvin Economist, Forest Service (WO)  
B.S., Agricultural Economics (University of Nebraska)

Bennett, Keith Resource Economist, BLM (Grand Junction DO)  
M.A., Community and Regional Planning (University of Wyoming)  
B.S., Sociology (Idaho State University)

Berg, Francis Chief of Resources, BLM (Redding RA)  
B.A., Anthropology (University College of Riverside)

Blankenship, Cassandra Staff Assistant, BLM (MTSO)  
Diploma, Secretarial Science (International Business College)

Bodman, Cory E. Natural Resource Specialist  
BLM (Yuma DO)  
B.S., Natural Resource Management (Tennessee Technological University)

Bower, Geraldine Branch Chief, Social Impact Analysis, Forest Service  
Post Doctoral (University of Arizona)  
Ph.D., Human Ecology (Michigan State University)  
M.S., (University of Utah)  
B.S., Social Science (University of Utah)

Boyd, Ray Wildlife Management Biologist, BLM (SC)  
M.S., Range Management (Colorado State University)  
B.S., General Science and Game Management (Colorado State University)

Bumstead, Jon S. University Liaison, Flagstaff (AZ)  
M.S., Applied Sociology (Northern Arizona University)  
B.S., Forest Management (University of Washington)

Bunch, Troy Chief, Mapping Sciences, BLM (IDSO)  
B.A., Management (Metropolitan State College)  
M.A., Political Science (University of Colorado)

Burns, Rich Area Manager, BLM (Alturas RA)  
B.S., Rangeland Management (Oregon State University)

Burton, Tim Fisheries Program Leader, Forest Service (Boise National Forest)  
M.S., Watershed Sciences (Utah State University)  
B.S., Geology (University of Utah)



Carbajal, Judy      Realty Specialist, BLM  
(AZSO)  
B.S., Marketing/Real  
Estate  
(Arizona State University)

Clabaugh, Patricia      Social Scientist and  
Planner, Forest Service  
M.S., Planning  
(University of Wyoming)  
B.S., Recreation and Park  
Administration  
(University of Wyoming)

Conroy, Scott D.      Supervisory Range  
Conservationist,  
Forest Service  
(Toiyabe National Forest)  
M.S., Natural Resource  
Management (University  
of Nevada - Reno)  
B.S., Forest Resource  
Management  
(University of Idaho)

Cordery, Ted      Endangered Species  
Coordinator  
BLM, AZSO  
B.S., Wildlife  
Management  
(Humboldt State  
University)

Crawford, Terry      Branch Chief, LPD,  
Economics Research  
Service  
Ph.D., Agricultural  
Economics  
(Cornell University)

Cross, Suzanne      Public Affairs Specialist,  
BLM (WO)  
B.A., Political Science  
(University of Colorado)

Dabbs, Tom      Wildlife Biologist, BLM  
(Vernal DO)  
B.S., Wildlife  
Management (Humboldt  
State University)

Dahl, Christopher      Assistant Sociologist,  
BLM (WO)  
A.B., Human Biology  
(Stanford University)

Danna, Tony      Area Manager, BLM  
(Surprise RA)  
B.S., Range Management/  
Botany  
(California State  
University)

Darby, David      Special Assistant, BLM  
(COSO)  
M.A., International  
Relations  
(American University)  
B.A., English Literature  
(Swarthmore College)

DeVilbiss, John M.      Regional Economist,  
Forest Service (Rocky  
Mountain Region,  
Boulder, Colorado)  
Ph.D., Natural Resource  
Economics  
(Michigan State)  
M.S., Economics  
(Colorado State)  
B.S., Forestry Management  
(Iowa State University)

Doran, Peter      Supervisory Visual  
Information  
Specialist, BLM (SC)  
B.A., Fine Arts  
(Metropolitan  
State College)

Dreier, Gary      Range Conservationist,  
BLM (WO)  
B.S., Range Science  
(Utah State University)

Ellis, Dalton  
"Butch"      Resource Coordinator,  
Forest Service  
(NE National Forest)  
B.S., Range Management

Elmore, Wayne      State Riparian Specialist,  
BLM (ORSO)  
B.S., Forest Management  
(Oklahoma State  
University)



Fahlgren, John G. Supervisory Range Conservationist BLM (Valley RA) B.S., Range Management (Montana State University)

Favinger, Wendy Regional Economist, BLM (MTSO) B.A., Economics (University of Nevada)

Ferguson, Mike Program Analyst, BLM (WO) B.S., Wildlife (Humboldt State University)

Fox, Jim Chief, Division of Rangeland Resources, BLM (WO) M.S., Natural Resource Administration (Colorado State University) B.S., Range Conservation (Colorado State University)

Frost, Charles District Manager, BLM (Miles City DO) B.S., Forestry (Stephen F. Austin State University)

Garretson, Diana ("Punkie") Public Affairs Specialist, BLM (WO) B.S., Government (New Mexico State University)

Gorges, Mark Fishery Biologist, BLM (WYSO) M.S., Fish and Wildlife Management (Montana State University) B.S., Fish and Wildlife Management (Montana State University) B.S., Biology (Manhattan College)

Happel, Paul T. District Outdoor Recreation Planner, BLM (Roswell DO) B.S., Recreation and Park Management (University of Oregon)

Hartzell, Tim Grand Junction District Manager, BLM M.S., Natural Resources Management (University of Nevada) B.S., Earth Sciences (Kent State University)

Haskins, Fred General Physical Scientist, BLM (WO) B.A., Environmental Sciences (University of Virginia)

Hill, Linda Writer/Editor, BLM (SC) B.A., Journalism (Colorado State University)

Hilliard, Mark Wildlife Appreciation Program Manager, BLM Western Fish and Wildlife Staff M.S., Wildlife Science (Utah State University) B.S., Wildlife Management (Humboldt State College)

Hinckley, Dan Riparian Wildlife Biology Coordinator, BLM (MTSO) B.S., Wildlife Management (Utah State University)

Hooper, Ron Riparian Coordinator, BLM (AZSO) B.S., Outdoor Recreation and Rangeland Hydrology (Utah State University)



Hubbs, Del Range Conservationist, Forest Service (Inyo National Forest) B.S., Resource Management (University of California - Davis)

Hudgens, Brenda Staff Assistant, BLM (WO) (University of the District of Columbia; Student)

Jacobs, Tom Range Conservationist, BLM (Medford DO) B.S., Range Conservation (Washington State University)

Jenks, Frank Recreation Planner, BLM (Boise DO) B.A., Anthropology (University of Toledo)

Kapus, Jennifer Visual Information Specialist BLM (SC) B.F.A., Creative Arts (University of Colorado, Denver)

Kiracofe, Steve Soil Scientist, BLM B.S., Agronomy (University of Maryland)

Kleweno, Doug Section Leader Farm Inputs, NASS/ES B.S. Agricultural Economics (Washington State University)

Kolkman, Gene Planning and Environmental Analyst, BLM (WO) B.A., Economics (University of Colorado)

Koselak, Janine Visual Information Specialist BLM (SC) B.F.A., Fine Arts (Metropolitan State College)

Kotter, Kurt Range Conservationist, BLM (WO) M.S., Range Science (Utah State University) B.S., Wildlife (Utah State University)

Kraayenbrink, Joe Wildlife Biologist, BLM B.S., Wildlife and Fisheries Sciences (South Dakota State University)

Lechefskey, Dan Land Use Specialist, BLM (MISO) B.S., Forest Botany (State University of New York City and University of Nevada)

Ledbury, Dan Agricultural Statistician, NASS/ES B.S., Agricultural Economics (Oregon State University)

Leonard, Steve Rangeland Field Representative, BLM (WO/NVSO) B.S., Range and Forest Management (Colorado State University)

Loth, Ed Refuge Program Specialist, Fish and Wildlife Service (WO) B.S., Wildlife Biology (Colorado State University)

Loving, Lorrie Staff Assistant, BLM (WO)

McClure, Virginia Staff Assistant, BLM (NVSO) (University of Nevada; Student)

McCormick, Jerry Range Specialist, Forest Service (WO) B.S., Forest/Range Science (Colorado State University)



McGinty, Herbert K.	Writer-Editor, BLM (Training Center) M.A., Geography (Clark University) B.A., History (Duke University)	Masinton, Roy	Fishery Biologist, BLM (NMSO) B.S., Fishery Biology (Colorado State University)
McNatt, Randy M.	Fishery Program Lead/ Riparian Coordinator, BLM (NVSO) Ph.D., Zoology (Arizona State University) B.A., Zoology (Utah State University)	Mathews, Ken	Agricultural Economist, Economic Research Service Ph.D., Economics (North Carolina State University) M.S., Agricultural Economics (Texas Technology College) B.S., Wildlife Science (Texas A&M)
McVicker, Gary	Ecosystem Program Manager, BLM (COSO) B.S., Range Management (University of New Mexico)	Mehlhoff, Sue	Environmental Scientist, BLM (WO) B.S., Petroleum Engineering (University of Wyoming)
McWhirter, David C.	Assistant District Manager BLM (Rawlins DO) B.S., Range Watershed Management (Utah State University)	Miles, Thomas	Supervisory Range Conservationist, BLM (Jordan RA) B.S., Wildlife Management (Humboldt State University)
MacDonald, Carol	Public Affairs Specialist, BLM (WO) M.A., English (University of Denver) B.A., English (University of Denver)	Moore, Marcia	Planning and Environmental Analyst, BLM (WO) M.A., Science Writing (Johns Hopkins University) B.A., Biology and Business Management (Alverno College)
MacPhee, Douglas	Range Conservationist, Forest Service B.S., Resource Management (University of Tucson, AZ)	Moore, Steve	Environmental Coordinator, BLM (Grand Junction DO) M.S., Agricultural Economics (Colorado State University) B.A., History (University of Santa Clara)
Madry, Nina	Cartographic Technician, BLM IDSO (Boise State University; Geography Student)		
Mangan, Larry	Wildlife Biologist, BLM (Coos Bay, OR) B.S., Biology (Loyola University)		



Morgan, Larry Range Conservationist, BLM (California Desert District) B.S., Range Management (California State University)

Muller, Dan Chief, Soil, Water, and Air Section, BLM (SC) B.S., Watershed Science (Colorado State University)

Murphy, Dennis Hydrologist, BLM (Montrose DO) B.S., Forestry/Watershed (Utah State University)

Myers, Paul Regional Economist, BLM (NVSO) B.S, Economics (University of Nevada)

Nelson, Ken Section Leader, Livestock Research, Economic Research Service Ph.D, Agricultural Economics (Oklahoma State) M.S., Agricultural Economics (Oklahoma State) B.A., Economics (Nebraska Wesleyan University)

Nelson, Robert Economist; Office Policy Analysis, Department of the Interior (WO) Ph.D, Economics (Princeton University) B.A., Mathematics (Brandeis University)

Nowak, Tim Archeologist, BLM (Rawlins DO) M.A., Anthropology Archeology (Harvard University) B.A., Anthropology (University of Minnesota)

O'Neal, Toris E. Economist, Forest Service (WO) B.A., Economics (Howard University)

Otteni, Lee Special Assistant to the Director, BLM M.S., Wildlife/Range Management (Texas Tech) B.A., Wildlife Management (New Mexico State University)

Pack, Lean Range Conservationist, BLM (SC) M.S., Wildlife Biology (Utah State University) B.S. Life Science Education (Utah State University)

Perotto, Louise (Laurie) Idaho State Grazing Authorization and Billing System Coordinator, BLM (Idaho Falls)

Peters, Thomas Assistant District Ranger Forest Service, Mark Twain National Forest B.S., Wildlife Management (Humboldt State University)

Phillips, Gerry Staff Assistant, BLM (SC)

Phillips, Margaret Recreation Planner, BLM (NVSO) M.S., Public Administration (California State University -Bakersfield) B.A., Planning (Western State College)



Prentice, Patricia Office Automation Assistant, BLM (Grand Junction DO) B.S., Organizational Management (Colorado Christian University)

Prichard, Don Fishery Biologist, BLM (SC) B.S., Fisheries Biology (Colorado State University)

Pruiett, Brian Range Conservationist, BLM (Buffalo RA) B.S., Range Management and Soil Science (Skagit Valley College)

Pulliam, David E. Wildlife Biologist, BLM (NVS0) M.S., Range/Forest Management (Washington State University) B.S., Range Management (Washington State University)

Ramey, George Range Conservationist, BLM (WO) B.S., General Forestry (Utah State University)

Rathbun, Daniel C.B. Special Assistant to Nevada State Director BLM (NVS0) B.S., Range Management (New Mexico State University)

Rawson, Jeff Range Conservationist, BLM (AZSO) B.S., Wildlife (Utah State University)

Richardson, Sue Data Administrator, BLM (WO) M.S., Sociology (Texas A&M University) B.S., Sociology (Texas A&M University)

Riracofe, Stephen B. Soil Scientist, BLM (Worland DO) B.S., Agronomy (University of Maryland)

Ririe, Warren Rangeland Management Specialist, Forest Service (Boise National Forest) M.S., Forestry (Michigan State) B.S., Range Conservation (Idaho State University)

Rising, Mike Wildlife, Range and Watershed, Apache Setgraves National Forest B.S., Range Science and Agriculture Business (New Mexico State University and Eastern New Mexico State University.)

Romaniello, Charles G. Industry Economist, BLM (COS0) M.S., Natural Resource Economics (University of Arizona) B.A., Anthropology (University of Arizona)

Salinas, Fred S. District Ranger, Forest Service (Gallatin National Forest) B.S., Rangeland Resource Management (University of Idaho)

Salt, Tim Evaluation Specialist, BLM (WO) B.S., Natural Resources Management (California Polytechnic State University)

Secrist, Glen Chief, Branch of Range Management, BLM (WO) B.S., Range Science (Utah State University)



Seegmiller, Phil Range Conservationist, BLM (Arizona Strip DO) B.S., Outdoor Recreation (Utah State University)

Shaw, Elena Supervisory Range Conservationist, BLM (Burley DO) B.S., Range Science (New Mexico State University)

Shilling, Mikel J. Branch Chief, Forest Service B.S. and B.A., Marketing (University of Arizona)

Siminoe, Ben Branch Chief, Range, Wildlife, Watershed and Air, Humboldt National Forest B.S., Forestry and Range Management (Colorado State University)

Siverts, Eric Economist, Forest Service (WO) Ph.D., Forest Economics (Michigan State) M.S., Forest Management (Colorado State) B.S., Forest Management (Colorado State)

Slack, Jay General Biologist, Fish and Wildlife Service (WO) M.S., Biology (Illinois State University) B.S., Biology (Illinois State University)

Smith, Eric Statistician (Biology), Forest Service (WO) Ph.D., Forest Economics (University of Minnesota) M.S., Forest Management (Iowa State University) B.S., Recreation (Iowa State University)

Soto, Maria Staff Assistant, BLM (Bakersfield)

Sparks, Donnie District Manager, BLM (Canon City) M.S., Range Science (Colorado State University) B.S., Range Science (New Mexico State University)

Stabler, Fred Wildlife Biologist, BLM (WO) M.S., Fisheries Resources (University of Idaho)

Stiles, Mark Regulations Analyst, BLM (WO) M.S., Economics (Colorado State University) B.S., Wildlife Biology (Colorado State University)

Stout, James Resource Officer, Forest Service (Klamath National Forest) B.S., Range Management (Humboldt State University)

Talbot, Neil Planning and Environmental Analyst, BLM (NVSO) B.S., Range Management (Utah State University)

Tower, Jerald D. District Forest Ranger, Forest Service (Caribou National Forest) M.S., Range Ecology (UNR) B.S., Botany (Brigham-Young University)

Trent, Joan Sociologist, BLM (MTSO) M.En, Environmental Science (Miami University of Ohio) B.A., Psychology (Miami University of Ohio)



VanWyhe, Janis Associate District Manager  
BLM (Shoshone DO)  
B.A., Environmental  
Studies  
(San Jose State University)

Vaughn, Christina Staff Assistant, BLM (SC)  
(Pikes Peak Community  
College)

Vienop, James Writer/Editor,  
BLM (Klamath)  
B.A., Biology  
(Humboldt State  
University)

Wade, Beatrice Planning and  
Environmental  
Coordination, BLM (ESO)  
B.S., Forestry/Wildlife  
Management/Range  
Ecosystem Management  
(University of Florida)

Waite, Don Chief, Branch of Soil,  
Water and Air, BLM (WO)  
M.S., Resource Economics  
(Colorado State  
University)  
B.S., Agricultural  
Economics (Montana  
State University;  
Colorado State  
University)

Walker, Tom Chief, Division of  
Planning and  
Environmental  
Coordination, BLM (WO)  
B.S., Natural Resource  
Management  
(California Polytechnic  
State University)

Wasser, Allyn S. Range Staff Officer,  
Forest Service  
(Kaibab National Forest)  
B.S., Range Management  
(Colorado State  
University)

Whitterieud, Craig Assistant Director/Range,  
Renewable Resources  
Staff, Forest Service  
(Rocky Mountain Region)  
B.S., Range Management  
(Utah State University)

Weiss, Marvin Natural Resource  
Specialist, BLM (AZSO)  
B.S., Agronomy  
(University of Wyoming;  
University of Colorado)

Williams, Jeff T. Economist, BLM (UTSO)  
M.S., Resource  
Economics, ABT  
(Utah State University)  
B.S. Range Science  
(Utah State University)

Williamson,  
Robert Director of Range  
Management,  
Forest Service (WO)  
B.S., Range Management  
(Utah State University)

Willis, Dennis Outdoor Recreation  
Planner, BLM (Moab DO)  
B.S., Renewable Natural  
Resources (University of  
Nevada)

Woerner, Robert Writer/Editor, BLM (SC)  
B.A., English  
(Grand Valley  
State College)

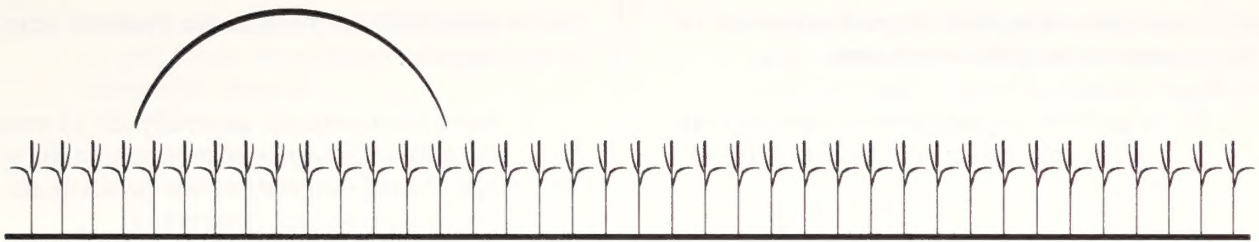
Woosley, Terry Chief, Branch of  
Biological Resources,  
BLM (NVSO)  
B.S., Forest Management  
(Colorado State  
University)

Maps were prepared by the BLM Idaho State  
Office, Cartographic Section: Troy Bunch  
(Chief), Nina Madry, Clarence Ouellette,  
Stephanie Singer, Matt Muta, and Denise Beck.









## APPENDIX A

# Forest Service National Policy and Objectives for Managing Rangeland Resources

*Forest Service national policy and objectives for managing the rangeland resource are defined in Forest Service manuals covering programs such as range management, wildlife and fisheries management, and watershed management. National policy and objectives for range management are listed in the 2200 Volume of the Forest Service Manual System.*

*Objectives of the range management program for the national forests and grasslands are as follows:*

- 1. To manage range vegetation to protect basic soil and water resources, provide for ecological diversity, improve or maintain environmental quality, and meet public needs for interrelated resource uses.*
- 2. To integrate management of range vegetation with other resource programs to achieve multiple use objectives in forest land and resource management plans.*
- 3. To provide for livestock forage, wildlife food and habitat, outdoor recreation, and other resources dependent on range vegetation.*
- 4. To contribute to the economic and social well-being of people by providing opportunities for economic diversity and by promoting stability for*



communities that depend on range resources for their livelihood.

5. To provide expertise on range ecology, botany, and management of grazing animals.

In addition to the above objectives, the following apply to national grasslands:

1. To promote the development of grassland agriculture and sustained yield management of the soil, water, forage, fish and wildlife, recreation, and timber resources.
2. To demonstrate sound and practical principles of land use to favorably influence nearby areas and economies.

Basic policies for range management on national forests and national grasslands are to:

1. Use appropriate methods, such as grazing use by livestock or wild ungulates, prescribed fire, and mechanical or chemical treatments, for managing range vegetation.
2. Identify and inventory range resources, including riparian, upland, and other critical areas to determine which meet or do not meet forest land and resource management plan objectives.
3. Implement and monitor measures to restore and enhance plant diversity and productivity, water quality, and soil stability.
4. Enhance or maintain the habitat of threatened, endangered, or sensitive species of plants and animals.
5. Determine suitability and potential capability for producing forage for grazing and browsing animals and for maintaining and enhancing habitat for fish and wildlife management indicator species.
6. Consistent with forest land and resource management plans, allow the use of forage by qualified livestock operators from

lands that are suitable for livestock grazing.

7. Issue term permits, generally for 10-year periods with appropriate terms, to allow use of range vegetation and promote stability for livestock enterprises.
8. Coordinate, cooperate, and consult with grazing permittees and grazing associations, and other interested parties in developing allotment management plans.
9. Emphasize permittee and association responsibility and accountability for meeting terms of permits, allotment management plans, and annual operating plans.
10. Recover administrative costs of permit transactions initiated by permittees.
11. Manage wild and free-roaming horse and burro populations in a thriving ecological balance within established territories.
12. Manage noxious weeds, using integrated pest management techniques in close coordination and cooperation with adjacent land owners and agencies.
13. Use cost effectiveness in range vegetation management.
14. Optimize involvement of expertise within the Forest Service, from other agencies, organizations, permittees, and others in range vegetation management.
15. Integrate range management and resolve conflicts through coordinated resource management by promoting voluntary cooperation among agencies, groups, and persons responsible for range resources on other land ownerships (FSM 1531.12e).

In addition to the policies above, the following policies apply to national grasslands:

1. Encourage user groups to assist in administering national grasslands, where such



groups clearly demonstrate the capability to participate in resource management in the public interest.

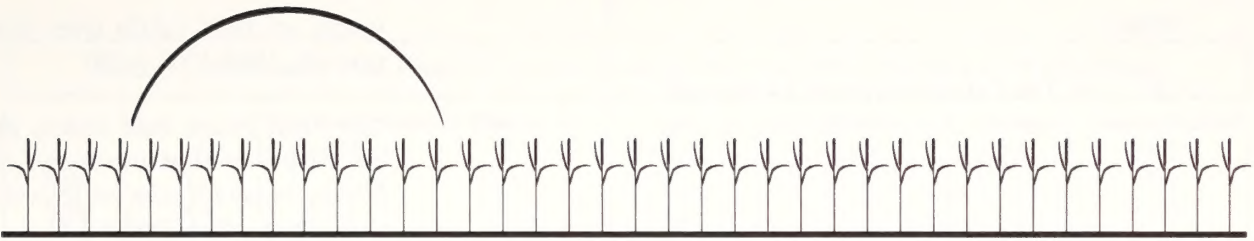
2. Demonstrate management flexibility and innovation in designing and implement-

ing resource management on national grasslands that will promote improved resource management on similar lands in other ownerships.









## APPENDIX B

# Technical Description of Fee Alternatives

*This appendix describes in detail the current fee formula established by the Public Rangelands Improvement Act (PRIA), including the various indices used in the formula and alternative indices. Technical descriptions are also included for the "PRIA with Technical Modifications" alternative and the "Regional" alternative. (The technical description and analysis titled "Appraised Market Rental Value of Grazing on Public Rangelands" included here provides the basis for the Regional fee alternative.)*

*The following analyses originally appeared in the Grazing Fee Review and Evaluation Update of the 1986 Final Report, a Report of The Secretaries of Agriculture and The Interior (April, 1992).*

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### **PRIA FORMULA**

#### **Basis of Formula**

*The PRIA formula consists of a base value of \$1.23 per AUM that is updated annually through a series of indices that measure changes in the private grazing land lease rates, the price of beef cattle, and the costs of livestock production. The base period for the indexes is 1964 to 1968. The PRIA formula is:*

$$\text{Calculated Fee (CF)} = \$1.23 \times \frac{(\text{FVI} + \text{BCPI-PPI})}{100}$$



Where:

CF = The Calculated Fee to be charged, which Congress defined as fair market value, which is the estimated economic value of livestock grazing to the user, and where annual increases or decreases in the fee are limited to a plus or minus 25 percent of the previous year's fee.

\$1.23 = The base value established in 1966 through the Western Livestock Grazing Survey (WLGS).

FVI = The Forage Value Index, an index of annually surveyed private grazing land lease rates, 1964-1968 = 100.

BCPI = The Beef Cattle Price Index, an index of USDA annually reported

prices of beef cattle over 500 pounds, 1964-1968 = 100

PPI = The PRIA Prices Paid Index, indexed prices that producers of livestock pay for selected production items, 1964-1968 = 100.

The performance of the PRIA grazing fee formula and its individual components are evaluated in this Chapter. A comparison of PRIA fees with the 1983 appraised market value, the former 1969 fee system, and possible improvements to formula components are also discussed.

Table 1 shows the formula indexes included in PRIA for the years 1964 to 1984 and the calculated PRIA value for public grazing fees. The PRIA formula, however, has only been used to calculate fees since 1979. The data for 1964 to 1979 are included to provide a long-term perspective on the response of the PRIA formula to its indexes.

**Table 1: Data Used to Compute Grazing Fees with PRIA Formula and PRIA Values**

Data Year	Fee Year	Private Grazing Land Lease Rate (PGLLR)	Forage Value Index (FVI) <sup>1</sup>	Beef Cattle Price	Beef Cattle Price Index (BCPI) <sup>2</sup>	Prices Paid Index (PPI) <sup>3</sup>	Unconstrained PRIA Fee Rates <sup>4</sup>
<b>Indexes for Base Years 1964 - 1968 = 100.</b>							
1964-68 \$3.65/Hd.Mo.			100	\$22.04/cwt.	100	100	1.23
<b>Indexes for Years 1969 - 1978:</b>							
1969	1970	3.82	105	27.00	123	113	1.41
1970	1971	4.05	111	29.50	134	118	1.56
1971	1972	4.06	111	29.50	134	124	1.49
1972	1973	4.17	114	36.80	167	130	1.86
1973	1974	4.57	125	43.00	195	140	2.21
1974	1975	5.82	159	39.20	178	168	2.08
1975	1976	5.75	158	35.20	160	198	1.48
1976	1977	6.37	175	36.10	164	215	1.52
1977	1978	7.06	193	36.00	163	230	1.55
1978	1979	7.11	195	47.60	216	246	2.03

*continued...*





**Table 1 (continued):** Data Used to Compute Grazing Fees with PRIA Formula and PRIA Values

Data Year	Fee Year	Private Grazing Land Lease Rate (PGLLR)	Forage Value Index (FVI) <sup>1</sup>	Beef Cattle Price	Beef Cattle Price Index (BCPI) <sup>2</sup>	Prices Paid Index (PPI) <sup>3</sup>	Unconstrained PRIA Fee Rates <sup>4</sup>
<b>Indexes During PRIA Executive Order 12548 Fee Formula, 1979 - 1992:</b>							
1979	1980	7.53	206	64.90	294	275	2.77
1980	1981	7.88	216	64.20	291	319	2.31
1981	1982	8.83	242	59.10	268	359	1.86
1982	1983	8.36	229	57.70	262	378	1.39
1983	1984	8.85	242	56.40	256	387	1.37
1984	1985	8.86	243	57.79	262	395	1.35
1985	1986	9.17	251	53.65	243	397	<sup>5</sup> 0.93
1986	1987	8.50	233	51.78	235	388	<sup>5</sup> 0.98
1987	1988	8.54	234	59.96	272	381	1.54
1988	1989	8.75	240	65.46	297	386	1.86
1989	1990	8.87	243	7.46	306	402	1.81
1990	1991	9.22	253	71.81	326	419	1.97
1991	1992	9.66	265	72.15	327	436	1.92

<sup>1</sup> The annual PGLLR divided by the 1964-1968 base PGLLR of \$3.65 and multiplied by 100 to convert to an index number.

<sup>2</sup> The annual beef cattle price divided by the 1964-1968 base beef cattle price of \$22.04 and multiplied by 100 to convert to an index number.

<sup>3</sup> Index of prices paid for livestock production inputs for beef cattle from November through October of the data year and weighted to reflect beef production in the Western States.

<sup>4</sup> PRIA calculated rates or economic value without applying plus or minus 25 percent limit on year-to-year change. For actual PRIA fee rates for the years 1979 - 1985 see Appendix Figure B.4.

<sup>5</sup> PRIA fee formula expired December 31, 1985, and indefinitely extended by EO 12548 (2/14/86) with a minimum of \$1.35 per AUM.

## Evaluation of the Formula

**Role and Effects of the Combined Index:** The intent of the PRIA formula has been to adjust the \$1.23 base value over time using the FVI to account for market changes and the difference between the BCPI and the cost of livestock production as measured by the PRIA formula PPI to account for changes in the permittee's ability to pay. The BCPI minus the PPI is the com-

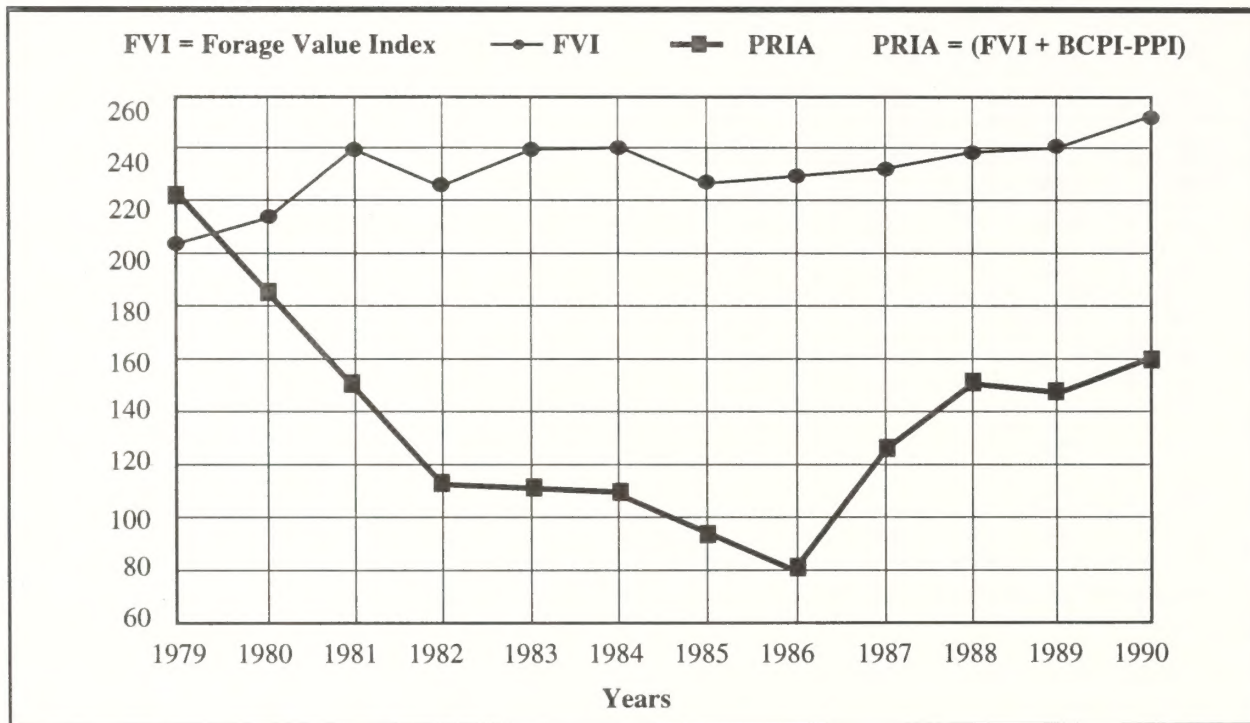
bined index and reflects short-term changes in the permittee's ability to pay, in addition to a level of ability to pay reflected in the FVI. A comparison of the results of PRIA with the FVI is shown in Figure 3.2 for the years of 1979 to 1990. Tying grazing fees to ability to pay has reduced the return to the Government from the public rangelands since 1979. This can be seen in the spread that has occurred between private grazing charges illustrated by FVI and the PRIA grazing fee indexes.



Figure 1 illustrates the difference between the index of private lease rates (FVI) and an index of PRIA. Since 1979, the inclusion of the combined index has resulted in a sharp downward trend in the PRIA values. From 1979 to 1990, the inclusion of the combined index has resulted in less revenues for the Government than would

have occurred if only the FVI was considered. In 1979, the PRIA value was greater than use of the FVI alone would have justified. Thus, the application of PRIA in 1979 reduced returns to permittees in that favorable market price and profit period due to the influence of the combined index. Since 1979 the public land permit-

Figure 1: A Comparison of the PRIA Formula and the FVI, 1979-1990



tees have paid less than they would have paid had only the index of the pre-PRIA formula of private lease rates (FVI) been used.

Figure 2 shows the PRIA (= FVI + BCPI-PPI) compared to a net returns index for the 1966 to 1991 period (1966 base year = 100). The net returns index was computed by the Economic Research Service (ERS) using livestock prices and production costs. Hay, grain and other costs were

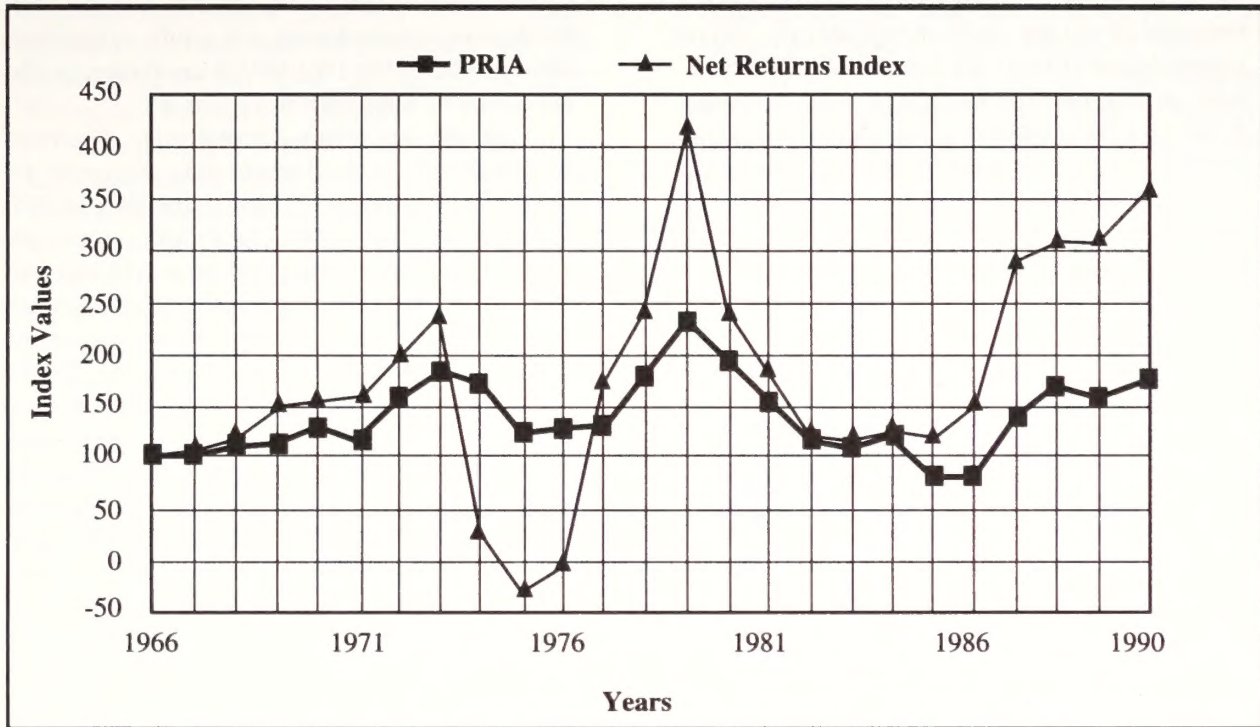
computed by using hay and grain prices and the PRIA PPI indexing. Until the mid 1980's, the PRIA formula followed the same general trends as the net returns and captured some of the annual variation and trend in the permittee rancher's ability to pay.

Since about 1984, the net returns index increased faster than the PRIA formula.





**Figure 2:** Comparison of PRIA and Net Returns Index - 1966-1990



Source: Brokken and McCarl, 1984, and USDA ERS, 1992.

**\$1.23 Base Value:** The 1966 WLGS, from which the \$1.23 base value was derived, was based on a 1964 economic study of grazing fees contracted by the FS and the BLM to Utah State University (USU). The objective was to develop a model that measured the annual economic value of grazing land use and occupancy to permittees of public rangelands. The economic model is described as follows:

"An economic model developed at USU is based on the assumption that the economic principles of supply and demand operate in a competitive range forage price market just as they do for products in other markets. The economic rationale of the study was the alternative cost concept. The essence of this principle is the value of public range forage used for grazing is equal to the rental value of private pastures leased for grazing after adjusting for differences in the costs of services provided on the private lands but not on public rangelands.

In other words, if a competitive market exists for grazing forage, total user costs for comparable public land and private ranges will be equal. If use cost differentials exist, ranchers in a competitive market will attempt to gain control of the low-cost forage source. The nonfee costs plus the private lease rate represent the total cost of operation on leased private land. When the nonfee cost items for public land users are subtracted from the total cost to the rancher leasing comparable private grazing land, the difference measures the dollar value a rancher should be willing to pay in a competitive market for the use of the public land." (Review of Federal Land Administration for Livestock Grazing, 1967)

In 1966, the USDA Statistical Reporting Service (SRS) interviewed 10,000 individuals in a one-time survey to obtain information on the fee and nonfee costs associated with the leasing of public and private grazing lands. The 1966



base value for public lands of \$1.23 per AUM, as shown in Table 2, was derived from subtracting the total of the fee and nonfee costs (\$4.54) on private leases (\$4.54 - \$3.28 = \$1.26). The numbers in parentheses in Figure 3.4, \$1.26 and \$1.13, are the values that equalize the costs of grazing the private leased lands and the public lands, or what the model represented as the fair market value of grazing public rangelands for cattle and sheep respectively. These values were weighted by the number of cattle and sheep AUM's to derive the \$1.23 base value. Based on the annual survey by SRS from 1964 to 1968, the five-year average private grazing land lease rate was \$3.65 per AUM. This average rate was used to form the FVI that was used as the annual adjustment mechanism in the 1969 Fee System and the PRIA Fee System.

Another way of understanding the derivation of the \$1.23 base value is by subtracting nonfee differential costs of \$.53 per AUM for cattle and an additional \$.02 per AUM for sheep, or a total of \$.55 in costs from \$1.78, the weighted average private grazing land lease rate found in the 1966 WLGS. The results of the 1966 WLGS were applied by the FS and the BLM in

the 1969 grazing fee formula (Study of Fees for Grazing on Federal Lands, 1977). Nonfee costs for grazing private leased and public rangelands determined by the 1966 WLGS are shown in [the Fee Study's] Appendix B, Figure B.9.

The 1983 appraisal of rental value, discussed in Chapter 2, used a market data approach instead of a cost approach (used in the 1966 WLGS) to establish a fair market base value. Since the \$1.23 base value is nearly 20 years old, the current PRIA formula could have been updated through the use of the 1983 market value appraisal results presented in Chapter 2. The FS and the BLM in 1981 as part of the current grazing fee study, chose not to update the 1966 WLGS because (1) private grazing land lease rates, obtained through a market appraisal and analysis, were needed for comparison with private grazing land lease rates obtained annually through the annual JES (USDA-SRS annual survey of farmers and ranchers (see Figure 4)); (2) the 1966 base value, which was derived from a differential cost base value, needed updating; and (3) the costs for repeating the 1966 WLGS in 1983 would have been in excess of \$4 million, as opposed to the \$2.8 million cost of the appraisal.

**Table 2: Summary Results of the 1966 Western Livestock Grazing Survey**

	Cattle		Sheep	
	Public	Private	Public	Private
Total Nonfee Costs	\$ 3.28	\$ 2.75	\$ 4.53	\$3.89
Lease rate	(\$1.26)	\$1.79	(\$1.13)	\$1.77
Total Costs	\$ 4.54	\$4.54	\$5.66	\$5.66
Derived FS/BLM Lease Rate	(\$1.26)	—	(\$1.13)	—
Difference for Private Lease	\$0.53	—	\$0.64	—
Weighted Private Lease Rate (Cattle and Sheep)		\$1.78		
Cattle and Sheep nonfee cost weighted difference: (Cattle 80%, sheep 20%)		- \$0.55		
Weighted nonfee costs difference		\$1.23		



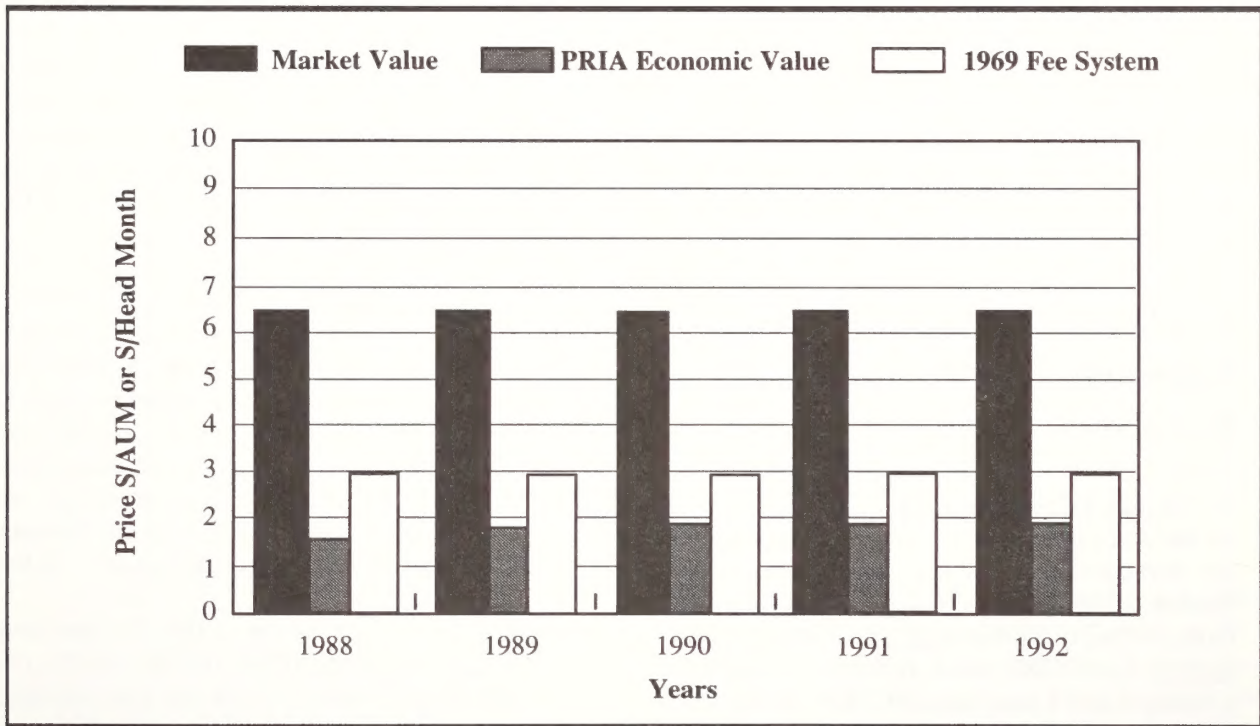
As part of the Fee Report Update, USDA's National Agricultural Statistics Service (NASS) indexed the 1966 Base Value (\$1.23) to a 1990 value of \$2.95 per AUM [see appendix Figure B.9 in the Fee Report Update].

Comparison of PRIA Fees with Westwide Indicated Market Value and the 1969 Fee System, 1988-1992: Measures of the PRIA formula's performance for 1988 to 1992 were derived from comparing the indicated market value for the public lands, as determined by the grazing rental appraisal, with fee rates that would have been derived from the former 1969 fee system. The FS and BLM appraisers, through a separate market analysis, observed that 1983 private grazing land lease rates were \$7.00 per head month (\$/AUM). As of January 1, 1992, the updated rate is \$8.00. After discounting ten percent for advance payment and an additional five percent

for comparability the indicated market value for grazing on public rangelands was \$6.84 per head month (Lau and Mitchell, January 1, 1992).

The 1969 fee system annually adjusted the 1964 to 1968 base value of \$1.23 by an index of the annual change in private grazing land lease rates. Figure 3 shows PRIA's performance in relationship to the indicated westwide market value and fee rates determined by the grazing fee system. The indicated westwide market value was based on 16 Western States, while the PRIA and the 1969 grazing fee system values were based on 11 Western States. For the 5 years 1988 to 1992, the PRIA fees averaged 27 percent of the indicated market value, with a range from 24 percent in 1988 to 29 percent in 1990. The average PRIA fee was about 60 percent of the amount that the former 1969 system would have produced.

**Figure 3:** Comparison of the PRIA Fee with the Westwide Indicated Market Values and the 1969 Grazing Fee System, 1988-1992







**Table 3: Comparison of PRIA Values with the Indicated Market Values and the 1969 Grazing Fee System Values, 1986-1992**

Fee Year	PRIA Fee Rates \$/AUM	Indicated Market Value \$/Hd Mo <sup>1</sup>	PRIA Minus Indicated Market Value \$/Hd Mo	1969 Fee System Values <sup>2</sup>	PRIA Minus 1969 Values
1986	1.35	6.27	4.92	3.09	-1.74
1987	1.35	6.37	5.02	2.87	-1.52
1988	1.41	6.46	5.05	2.88	-1.47
1989	1.86	6.56	4.70	2.95	-1.09
1990	1.81	6.65	4.84	2.99	-1.18
1991	1.97	6.75	4.78	3.11	-1.14
1992	1.92	6.84	4.92	3.26	-1.34

<sup>1</sup> Indicated westwide market value after adjustment for comparability and advanced payment, and assumes a straightline increase to the January 1992 estimated market value reported by Lau and Mitchell.

<sup>2</sup> Fee rates which would have been charged under the 1968 to 1977 fee system (i.e., \$1.23 indexed only by FVI).

As shown in Table 3, the differences for the years 1986 to 1992 between the PRIA rates and the indicated westwide market value range from \$4.70 per AUM to a high of \$5.05 per AUM, or an average difference of \$4.89 per AUM.

## Evaluation and Improvement of Formula Indexes

**Forage Value Index (FVI):** The FVI is used in the PRIA grazing fee formula to update the fee determination for annual changes in the market value of public grazing lands. The FVI index is based on the NASS Annual July Cattle Survey. Since 1986, NASS Private, nonirrigated, Grazing Land Lease Rate (PGLLR) survey data has shifted from the June Enumerative Survey (JES) to the July Cattle Survey. Both are comparable probability based surveys and all respondents are cattle producers. As part of the July Cattle Survey, cattle operators (permittees and nonpermittees) are asked to report what private grazing lands are renting for in their area on a per AUM, per pair, and per head basis. The FVI

is a weighted average estimate of rental value per AUM for the 11 Western States. Each year's private lease rate is divided by the base period's (1964 to 1968) private grazing land lease rate of \$3.65 and multiplied by 100 to convert it to the annual index number or FVI.

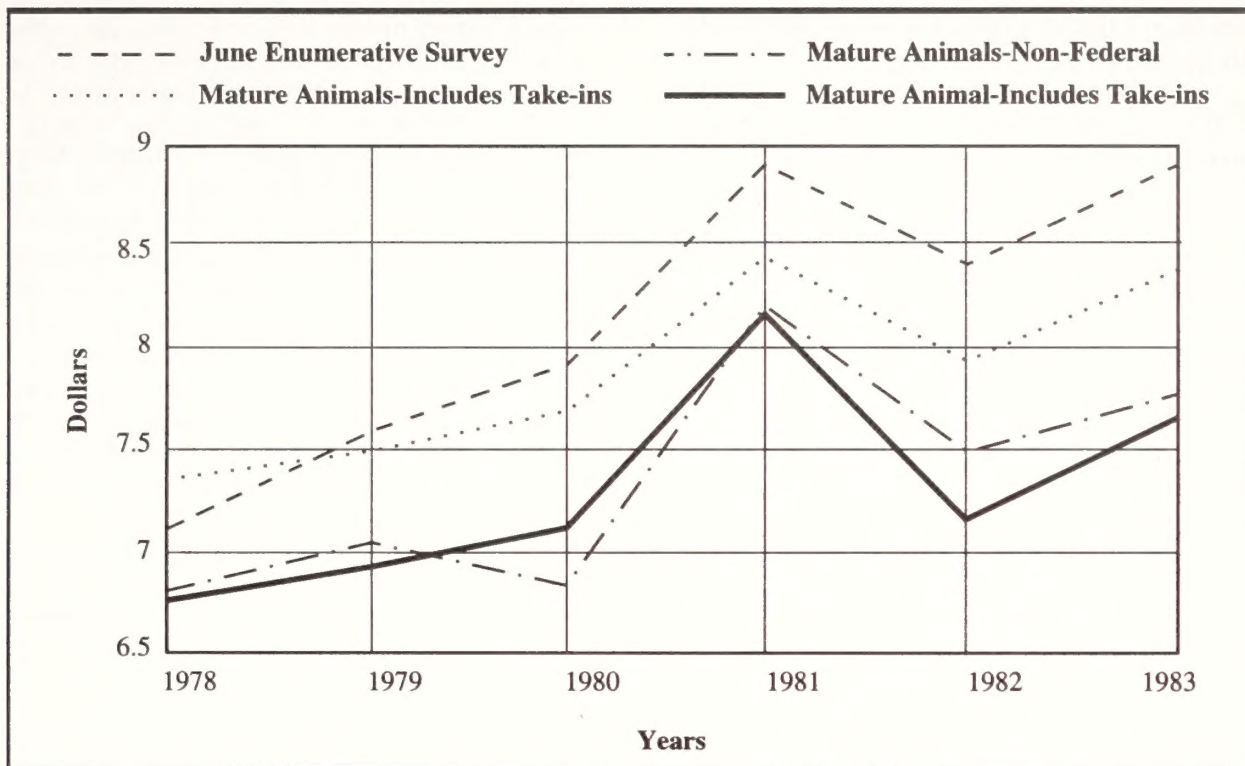
The FVI's use have caused concern by the livestock industry and the land management agencies about: (1) the lack of direct comparability between the quality of the land and the amount of services provided on the public and private grazing leases, and (2) use of a reporter type question and rancher response rather than actual price data, resulting in a lack of data for some States in some years (Nelson and Garratt, 1984). These two issues are discussed in order.

**Issue 1.** The accuracy of the JES was measured by comparing its results to the appraisal's results. This comparison showed that while the JES might not have been the best measure of actual prices or price trends in any individual State, it was a reliable short-term indicator of the westwide trends for private rangeland rental for mature animals. Prices paid for the private rental arrangements appeared to reflect market response to rancher demand for forage and the





**Figure 4:** Comparison of the 1983 Appraisal Values for Private Grazing Lease Rates and the June Enumerative Survey Values, 1978-1983. (Note: Appraisal data not available to update this figure).



available supply. Figure 4 illustrates the westwide correlation in the movement between the JES's estimated prices and the actual prices shown in the appraisal. A comparison of the JES and the appraisal also indicated that the JES's estimates on a westwide basis were fairly close to the prices being paid, but were consistently higher.

**Issue 2.** The survey used in estimating the FVI asks respondents to "report" what the average private grazing lease rate was in their area. Use of a reporter question has been criticized because it does not ask persons to identify known values but asked persons to recall or speculate on values. The closeness of the JES to the appraisal partially validated the use of the reporter question. Since the JES produces constantly higher results, it also suggests the possibility of an upward bias in absolute values. The real test of the JES's use for FVI is consistency of indices for FVI based on appraisal value and JES values for 1978-1983. Further studies by the FS,

the BLM, and the SRS indicated that the added benefits from improving the accuracy of the data were not worth the added costs (Nelson and Garratt, 1984). Responses in the July Cattle Survey, by those who actually "pay" for private grazing have been compared with those who "do not pay." This approach was used in 1990 and 1991, and will continue for 1992. Results, to date, indicate that "pay" versus "nonpay" rates do not differ significantly.

The survey sample used in deriving the FVI was weighted by the number of farm units. Concern also has been expressed over the weighting procedures since areas with large amounts of public land tend to have few farm units and, therefore, make up a very small proportion of the FVI sample. For example, California, with many farm units but few public grazing lands, was sampled more heavily than its neighboring State of Nevada, with few farm units, but a large amount of public land. The current JES weighting system has the advantage

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of being more representative of all livestock operators. The percent of public land AUM's, private leases, and beef cattle marketings by State are shown in Appendix B, Figure B-10, [of the Fee Report Update] and are summarized [below] in Figure 5.

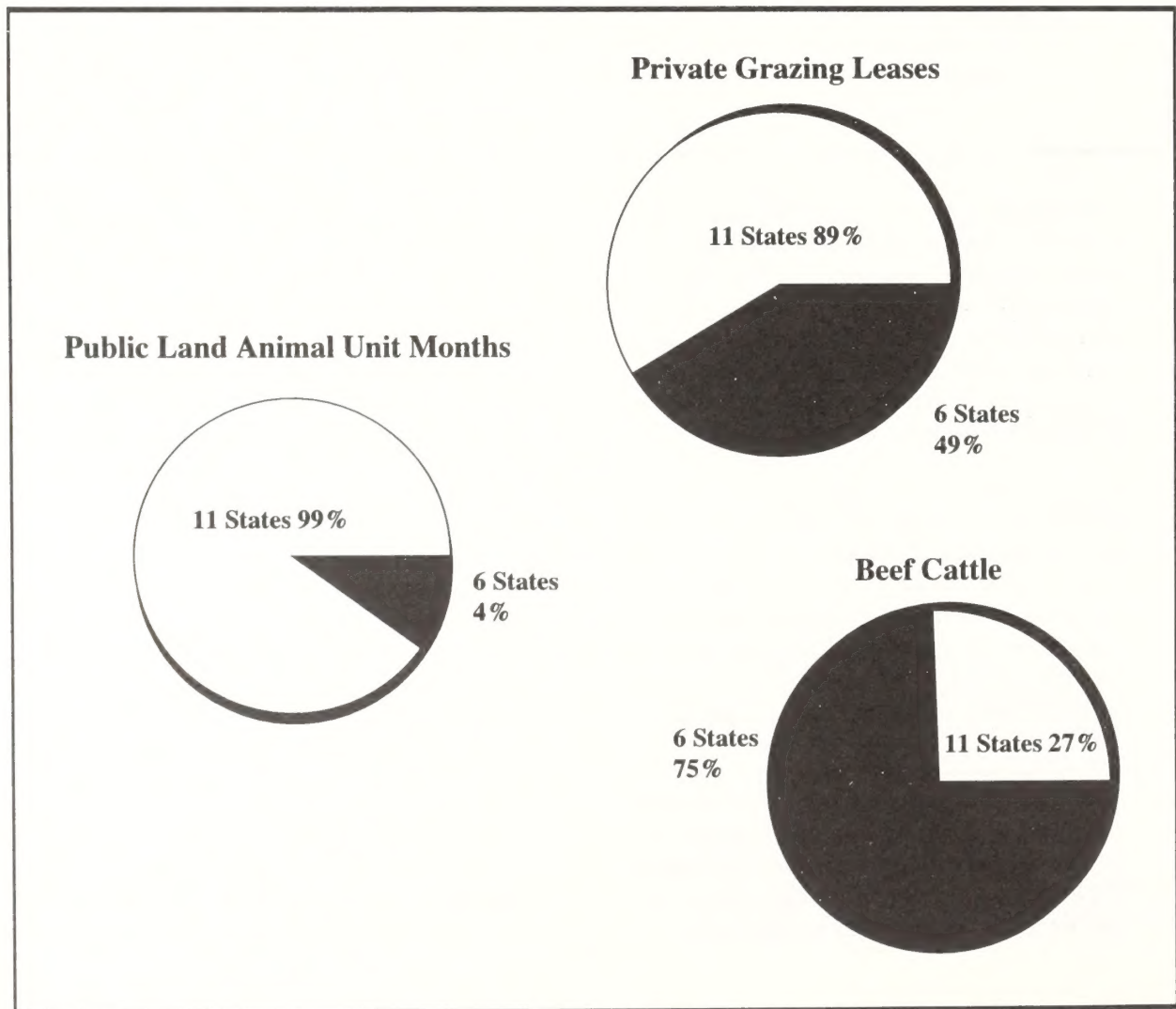
Weighting JES values by AUM's would result in a private lease rate value of \$7.23 per AUM that would bring it closer to appraisal values for 1983 versus the \$8.36 per AUM rate derived from the current weighting procedures.

As stated in Chapter 1, public rangelands, excluding National Grasslands, are defined in the PRIA as those lands administered by the FS and the BLM within the 16 Western States. Analysis of the PRIA fee formula showed that the majority of public rangelands and the associated AUM's of forage production were within the 11 Western States. The analysis also dis-

closed, as shown in Figure 5, that the majority of livestock production occurred in the Great Plains States, and that these States had higher private grazing land lease rates. Weighting July Cattle Survey private lease rate values by public rangeland AUM's would place emphasis on the use of private lease rates for the States where the majority of the public rangelands are located.

**Beef Cattle Price Index:** The USDA's NASS collects prices received by producers for cattle sold in 35 States. Since 1981, the livestock price survey has used a probability survey of auctions, stockyards, packers, and dealers. The sampled buyers report purchases of livestock from producers. Data provides the number of head purchased, total live-weight, and total dollars paid to the producer by the buyers before marketing costs (feed, water, trucking, commissions, inspections, etc.) are deducted. The average price by

**Figure 5:** Comparison of the Percent of AUM's, the Percent of Private Grazing Land Leases, and the Percent of Beef Cattle in the 11 Western States and the 5 Great Plains States





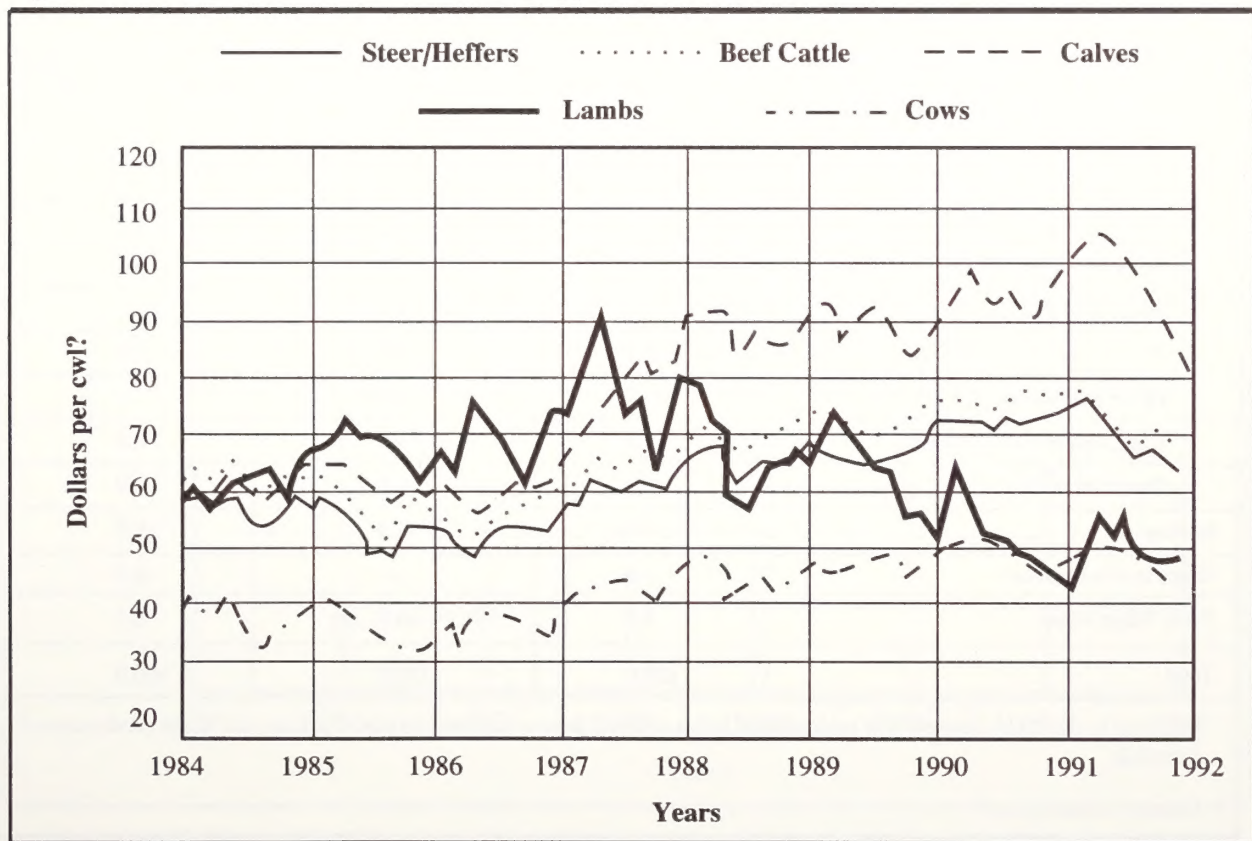
State reflects prices received for cattle marketed in each State. No information is obtained on the State of origin of the livestock marketed. The westwide price was determined by weighting each State's price by the total live-weight of livestock marketed. The NASS data used in the PRIA grazing fee formula were based on actual transactions during the 12-month, November-October period. An average annual price was computed. The annual price was converted to an index number by dividing the price by \$22.04 per hundredweight (the 1964-1968 average beef cattle price) and multiplying it by 100 (Thorpe and Holden, 1984).

The prices used for the index were for beef cattle, which were defined as marketed cattle that were marketed weighing over 500 pounds, including feeder and slaughter animals. Figure 6 shows the prices received by producers for different types of beef cattle. The NASS beef cattle price data used in the PRIA formula included the prices for steers, heifers, and cows over 500 pounds. Calves, defined as animals under 500 pounds, were excluded from this index. The BCPI as an index does not fully cover livestock which graze public rangelands since it does not contain data on calves (under 500 pounds) or

sheep. It also includes data on fat cattle (not produced on the public lands). Potential refinements to the BCPI are: (1) to modify it to include other classes of livestock (calves and sheep), (2) to modify it to exclude fat cattle, and (3) to update the base period to reflect market conditions in the 1990's. The first modification would bring the index more in line with the livestock products produced on the public lands. The current BCPI also could be refined by weighting the annual index by public land AUM's per State in each of the 16 Western States.

Adding calf prices to the existing BCPI to get a cattle price index would have an impact on the price pattern. The addition of calf prices would increase the level of the cattle price index or would decrease the BCPI due to wider cyclical variation in calf price. The average value change is relatively small because calves account for only 10 percent of the marketings on a live-weight basis in 1990, and calves have the same general price trends as beef cattle over time. In years where the spread between beef cattle and calf prices (such as 1987-1991) is relatively large, inclusion of calves would have an upward effect on the BCPI. Conversely, as the relative spread declines, a lower BCPI would be the re-

**Figure 6:** Monthly U.S. Prices of Livestock by Type, 1984-1992





sult. Figure 6, from 1984 to 1991, shows the price patterns for calves and sheep, both of which are excluded from the current NASS index, and for beef cattle (which includes steers, heifers, and cow). The conclusion in 1986 was to exclude calf prices since their inclusion would not significantly change the BCPI (Thorp and Holden, 1984).

The NASS recommends that data on sheep and lambs be excluded in any livestock price index for the following reasons: (1) data on sheep are not as reliable as the data used to prepare the other indexes, and (2) sheep make up such a small portion of livestock sales that the addition of the data would have only a minor effect on the index.

Modifying the index to exclude fat cattle would satisfy the concern that has been expressed about including cattle fed through feedlots in the formula price. This would require

the use of a new series that started in 1983, with no historical data before that year. The series would more accurately reflect the livestock on public land, but it is unlikely to reflect different price trends from the existing series. This is not recommended.

**Prices Paid Index:** The PPI in the PRIA formula is an index of selected components of the National Index of Prices Paid by Farmers (Thorp and Holden, 1984). Weights used to combine the selected components are based on the 1976 cost of production budget for cow-calf operations in the western region. Table 4 shows the selected components and the weights assigned to the components for the National Cost of Livestock Production Index and their regionalized application in the PPI developed for use in the PRIA formula.

The PPI used did not include: (1) the cost of living component represented by the Con-

**Table 4:** Comparison of the Factors Used in the National and the PRIA Prices Paid Indexes, and the Proposed Input Cost Index (ICI)

Index Components	National Index Of Prices Paid	PPI PRIA FORMULA <sup>1</sup>	ICI
Consumer Price Index	30.4	—	—
Production Commodities	57.6	80.0	66.2
Feed	11.8	—	42.6
Feeder Livestock	11.7	—	—
Seed	1.8	—	—
Fertilizer and Ag. Chemical	5.9	—	—
Fuels and Energy	3.5	14.5	6.7
Farm and Motor Supplies	2.2	12.0	—
Autos and Trucks	2.5	4.5	—
Tractors and Self-Prop. Machinery	4.5	4.5	7.2
Other Machinery	2.7	12.0	—
Bldg. and Fencing Material	3.6	14.5	4.8
Farm Services	7.4	18.0	4.9
Interest	4.0	6.0	<sup>2</sup> 19.0
Taxes and Insurance	2.8	—	6.3
Farm Wage Rates	5.2	14.0	8.5
Total	100.0	100.0	100.0

<sup>1</sup> PPI used in the PRIA formula is a regionalized index derived from a national survey of prices paid in the production of livestock.

<sup>2</sup> Nonreal estate interest



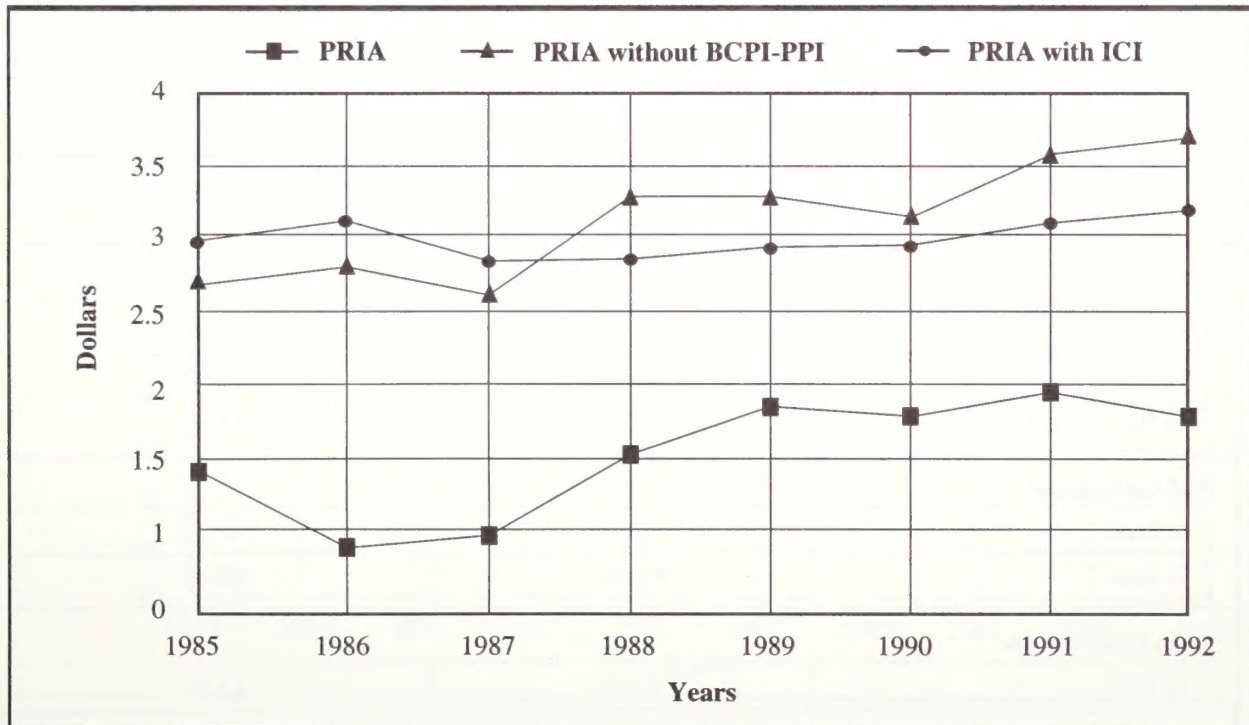
sumer Price Index; (2) components of farm origin (feed, feeder livestock, seed, and fertilizer); or (3) taxes. The components of farm origin were excluded because these components generally represented either elements of feed, feed production (seed and fertilizer), or livestock purchases included in other index components. The exclusion of these factors gives greater weight to components of livestock production highly affected by market change and inflation, such as fuel costs.

The PRIA formula PPI could be refined by expanding the index to include all livestock production costs of both farm and nonfarm origin. The components and suggested weights for the expanded index, which is titled the Input Cost Index (ICI), are also shown in Table 4. Production factors of nonfarm origin have increased in cost much more rapidly than production factors of farm origin. Excluding production factors of farm origin has resulted in an overstatement of the PRIA PPI permittee's production costs. Specific information in the ICI index is shown in [Fee Report Update,] Appendix B, Figures B.11 and B.12. Updating to 1992, the effects of including the ICI in the PRIA fee formula are shown in Figure 7. The ICI, without any other adjustments to the PRIA formula, would result in a 1990 fee of \$3.20 per AUM

instead of the \$1.81 per AUM fee derived from the current PPI. NASS prices paid input indexes used in both the PPI-PRIA and the ICI are "fixed weight indices" with data from 1971-73 making up the quantity component while the price component is current. Changes to the quantity of individual input required, since 1973, are not reflected in the prices paid indexes. The 1980-84 Cost of Production Survey weights, used to compute overall ICI, bring the index to a western cow calf basis and bring the mix of individual indices to a more current level but do not update the quantity component of the individual indices.

Alternative Index Weights: Currently, the PRIA formula PPI is based on a nationwide index weighted to 11 Western States to reflect production costs for cow-calf operations in the West. The FVI and BCPI are both 11-State indexes weighted by the number of private leases and the total live-weight cattle sales, respectively. The PRIA covers grazing in the 16 Western States using an 11 Western State data base. To be consistent with the language in the PRIA, grazing fees for public rangelands in the 16 Western States should be calculated based on data from the States where the fees are applied. If the indexes are based on 16 State's data rather than 11 States, problems arise because the 5 Great Plains

Figure 7: PRIA and the 1969 Formula Fee Values and the PRIA Computed Using the ICI





States dominate beef production, and a few States have private grazing land lease rates that appear to be disproportionately higher than rates in adjoining States. The States' share of BLM/FS AUM's, marketings, and private leases are shown in [the Fee Report Update,] Appendix B, Figure B.10, and are summarized in Figure 5 [above]. An example of the problem of expanding to 16 Western States is shown by looking at Nebraska with 25.8 percent of the market receipts and 17.6 percent of the private leases in 1990 but less than 1 percent of the comparable AUM's.

An alternative weighting method would be to use BLM and FS AUM's in each State. The AUM weights could be applied to both the BCPI and the FVI. This would make the indexes more representative of the relationship of public land grazing to market conditions. The difference that weighting makes in the relative values for the private grazing lease rate and beef cattle prices for 1983 used in the current PRIA formula, as opposed to what could be used, are shown in figure 3.12. The 1990 grazing fee based on current weights for the 16 Western States would have been \$2.71 per AUM, as opposed to an AUM weighted fee of \$2.25 (the actual 1990 fee based on 11 Western States was \$1.81 per AUM).

**Alternative Base Periods:** The PRIA formula currently uses a multi-year base period of 1964 to 1968 or each of the indexes, with the average of these years set to equal 100. The base period for the PRIA formula corresponds with the 1966 WLGS and the \$1.23 base value.

The USDA's NASS recommends that the base period for all indexes used in a grazing fee for-

mula be more reflective of current farming and ranching technology. Updates should be made about every 10 years. Data used for a grazing fee computation must be consistent, the units have to be in agreement, and the base periods for each of the formula index components should be the same or as closely related as possible. State level indexes for the FVI, BCPI, and PPI are not recommended. Sample sizes at the State level are small and result in more variability.

**Use of Actual Data:** If only actual data are used in the grazing fee formula, there will always be a time lag, unless data are projected forward. This lag in the responsiveness of the data to reflect a change in conditions can compound problems if conditions shift suddenly. As an example, an up or down change in the cattle price would affect the following year's fee rate at the very earliest, and would probably impact the rate 2 years later.

**Year-to-Year Variability:** This year-to-year variability can be reduced by using moving averages. The use of multi-year base weight periods for the indexes reduces the risk of using a single year that has abnormal relationships.

## Formula Construction

Additional modifications to PRIA could include dividing the BCPI by the PPI or cost of production index. The effect of using a ratio (BCPI/PPI) instead of subtracting PPI from BCPI is shown for 1982-1991 in Figure 8. Comparison

**Table 5:** Comparison of Alternative Weightings of the Private Grazing Land Lease Rate and the Beef Cattle Price Index, 1990

	Current Weighted Values	AUM Weighted Value <sup>1</sup>
<b>Private Grazing Lease Rate</b>		
11 State	\$ 8.87	\$ 8.42
16 State	\$ 9.31	\$ 8.46
<b>Beef Cattle prices</b>		
11 State	\$67.47	\$65.11
16 State	\$70.83	\$65.68
<b>PRIA Grazing Fees</b>		
16 State	\$ 2.71	\$ 1.91
<sup>1</sup> Weighted by Permitted to Graze Public Rangeland AUM's		



to the FVI also is shown. Using the BCPI/PPI ratio, as indicated by the graph, tends to dampen the variable effect that BCPI and PPI have on the fee. Use of the ratio rather than the absolute difference (BCPI - PPI) would prevent the sum of the indexes from going to zero or becoming a negative number. The ratio (BCPI/PPI) also tends to reduce the spread between the two differences (i.e., difference between the FVI and the FVI + BCPI - PPI, and the FVI and the FVI x BCPI/PPI).

## PRIA with Technical Modifications

Using all of the technical modifications discussed previously would change the PRIA formula to the following:

$$\text{Calculated Fee} = \text{Base Value} \times \frac{\text{FVI} \times (\text{BCPI}/\text{ICI})}{100}$$

Technical modifications are (1) compute the FVI weighted by public land AUM's per State for each of the 16 Western States instead of by the number of private grazing leases in each of

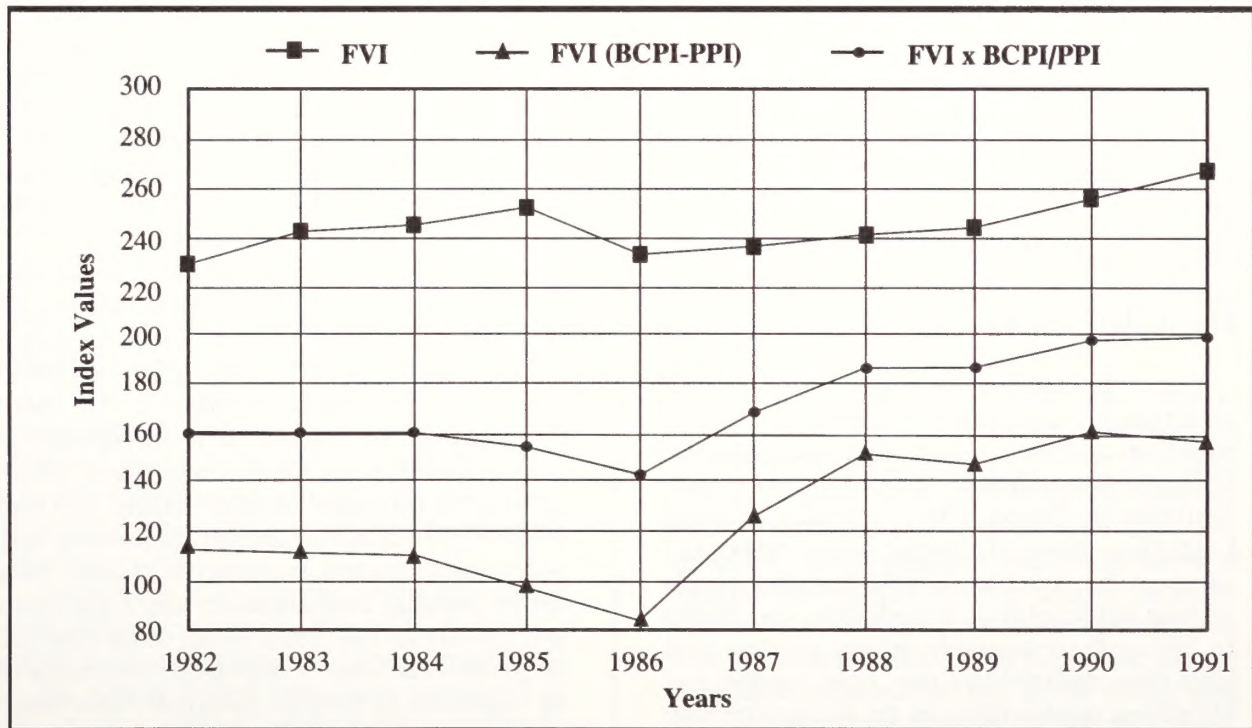
the 11 Western States, (2) compute the BCPI weighted by public land AUM's (as in number 1 above) instead of by total live-weight cattle sales in the 11 Western States, (3) use an ICI that includes all production costs of farm and nonfarm origin instead of the present PPI, (4) use 1989-1991 instead of 1964-1968 for a base period, and (5) use a ratio of the BCPI/ICI instead of subtracting one from the other.

## Appraised Market Rental Value of Grazing on Public Rangelands

### Purpose of Grazing Market Rental Appraisal

In the PRIA, Congress legislated a grazing fee formula and established fair market value of grazing lands by legislative definition. In House Report No. 95-1122, Congress charged the Secretaries to "refine the data on the value of the public rangelands as compared to privately owned rangelands." In response to the congress-

**Figure 8:** Comparison of the PRIA Formula, the PRIA Formula Using a Ratio of the Combined Index, and the FVI





sional charge, the FS and the BLM conducted a grazing rental market value appraisal of public rangelands. The two primary objectives of the appraisal were: (1) to establish a market value, which is the amount a livestock operator would pay for grazing use on the public lands if these lands were offered on the open market, and (2) to provide the information needed to compare that value with the public land grazing fees now derived from the current fee formula established by the PRIA.

## Definition of Fair Market Rental Value Used in the Appraisal

The American Institute of Real Estate Appraisers states that "an appraisal is an unbiased estimate of the nature, quality, value, or utility of an interest in, or aspect of, identified real estate, . . . is based on selective research into appropriate market areas; assemblage of pertinent data; the application of appropriate analytical techniques; and the knowledge, experience, and professional judgment necessary to develop a conclusion that is appropriate to the problem." Fair market rental value is defined as "the amount in cash, or in terms reasonably equivalent to cash, for which in all probability the grazing use would be rented or leased by a knowledgeable owner willing but not obligated to rent or lease to a knowledgeable renter or lessee who desired but is not obligated to lease." It was also defined as "the amount that livestock owners would probably pay for the grazing use if it were offered for rent or lease in the open market" (Brownell and Tittman, 1984a).

## Function of the Appraisal

The grazing market rental appraisal was undertaken to (1) provide market data from which to compare values obtained from the USDA-Statistical Reporting Service Annual June Enumerative Survey (JES) of Private Grazing Land Lease Rates (the Forage Value Index); (2) compare the closeness of PRIA fee rates, which include factors of cost of production and ability to pay, with comparable private grazing land lease rates obtained in a free, open market, and (3) place a market value on the occupancy, use,

and consumption of public rangeland forage where the leasing of grazing privileges through permit or lease is a form of purchasing resources.

A market value appraisal is an accepted and theoretically correct method for determining the value of land resources used in the production of livestock products. The market approach uses the "comparative lease method" to estimate current market values of resources and land services. The Bureau of Indian Affairs (Department of the Interior) has used this methodology extensively. The Department of Defense (Army and Navy) also used this methodology to determine rental value for other Federal grazing lands leased by the Army Corps of Engineers or the Navy. The method used in the FS/BLM appraisal was mass data appraisal, which provided a reservoir of market and related economic data for a specified area.

**Scope of the 1983 Appraisal.** The field work portion of the appraisal took 17 months to complete (July 1982 to November 1983). The field appraisers interviewed approximately 100,000 persons to identify who leased grazing lands. Those interviewed included bankers, appraisers, farm management specialists, loan officers, grazing permittees, nonpermittee livestock producers, etc. The appraisers developed lists of persons, from those interviewed, who leased grazing lands which they believed represented 80 to 90 percent of the transactions within the area surveyed. These interviews resulted in a transaction data base that contained 11,675 records. The 11,675 records contained 7,246 usable observations of different prices reflecting the results of open market negotiations between lessors and lessees for grazing use of lands by cattle, horses, yearling cattle, and sheep.

The appraisal covered 16 Western States, plus two counties in Texas, which were divided into six pricing areas (see Map 1). Criteria for selecting the boundaries of the pricing areas included the following, in order of priority: (1) mean county prices for mature cattle and horses; (2) consideration of the natural vegetation, which reflects the influence of soils, climate, and land features; (3) physical or geographic features; and, (4) political or administrative boundaries. Data on 99 physical characteristics and lease terms and conditions that could affect value were collected for each lease. The 99 items were reduced or combined to form 81 potential value deter-



mining factors. The most important factors are shown in [the Fee Study Update,] Appendix B, Figure B.8.

**The 1983 Appraisal Process.** The appraisers used appraisal techniques that acknowledged a wide range of conditions on individual allotments on the public rangelands, and recognized the impossibility of accounting for the differences between individual allotments or tracts. A universe of market transactions involving private leased rangelands, subleased public rangeland administered by the BLM and FS, and other Federal rangeland properties as of a given date were analyzed in a uniform manner. The appraisal used standard methodology and employed a common reference for data. This process is referred to as mass appraising and allows for statistical analysis of data for determining factors that influence value between the subject properties and comparable transactions. This process may use statistical data when (1) it shows high levels of correlation between factors and price, and (2) the sample size is sufficient to be reliable. The appraisers applied such statistical analysis and found some correlations of factors with value, but did not find any that were statistically significant. (See the Statistical Appendix to the Appraisal, Volume 2, Exhibit 13-10.) Therefore, they did not base the adjustments in the appraisal on the results of the statistical analysis of the factors and price data.

The value estimates presented do not represent the "site specific" fair market grazing rental value of any individual allotment. Rather, they are intended to represent a reasonable estimate of the mean average rental value of grazing on the public rangelands. Appraised market value reflects the highest price that a property will bring if exposed to sale or rent in the open market. There must be a willing seller (or lessor) and a willing buyer (or lessee), both knowledgeable of all uses of the property and neither being under abnormal pressure. The quantification of appraised value is based on this concept of market value. In the grazing rental appraisal, it is determined as an average value that would be realized from rental of all allotments available for grazing.

In arriving at an estimate of the fair market rental value for grazing on the public rangelands within each pricing area, the use and conditions on the private leased lands were compared to the use and conditions on the public rangelands. Based on a pure "qualitative analysis" of differ-

ent factors, it was the appraisers' judgment that any advantage the lessee of private lands might have over the public rangelands permittee/lessee, as a result of the general lack of stipulations or restrictions on the private lease, was at least partially offset by the guaranteed tenure, the rights of appeal, and the option of nonuse for 3 years at no cost that were afforded the public rangeland permittees/lessees.

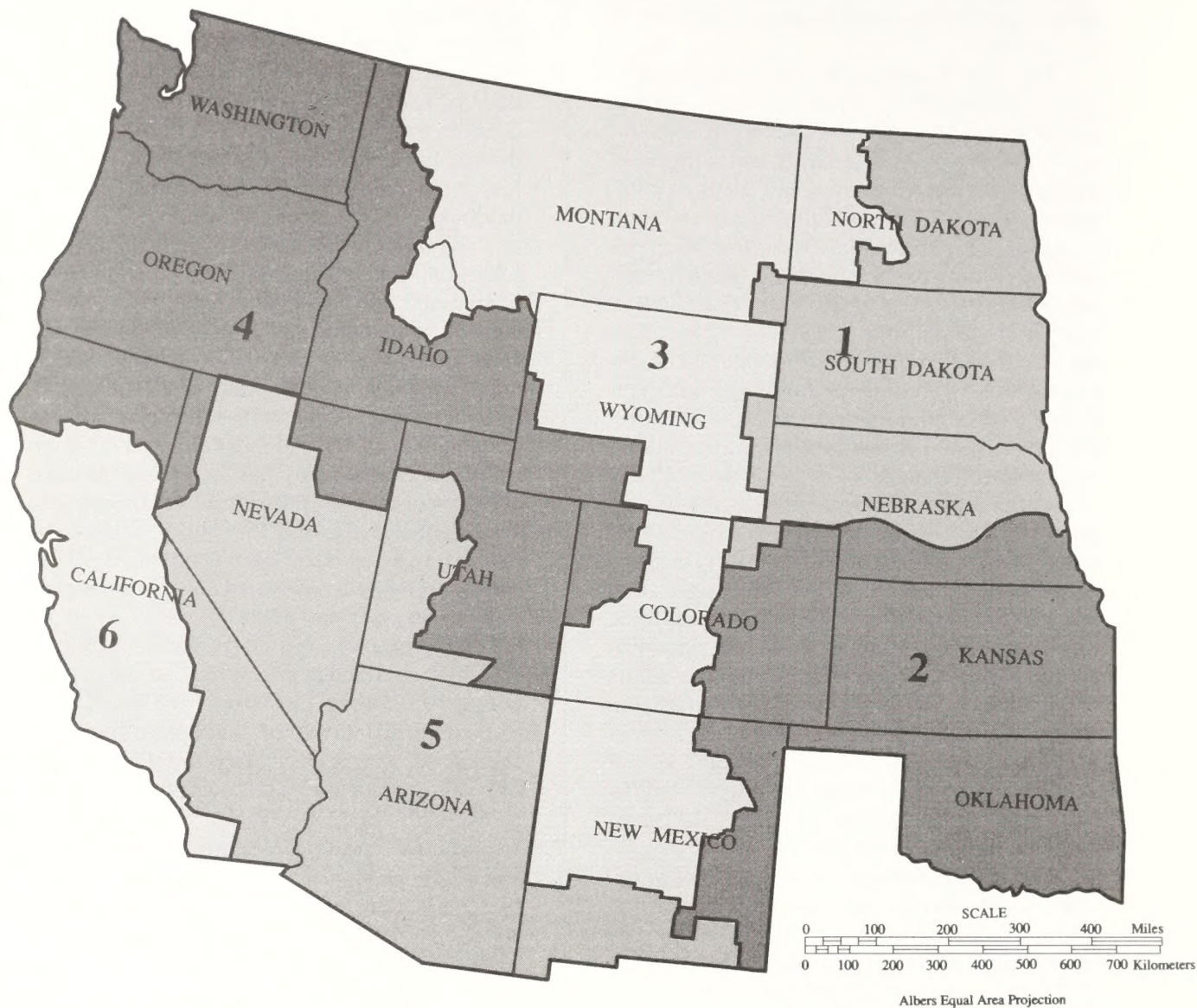
The analyses showed there were different prices being paid for different kinds and types of animals. They also showed there were differences in prices being paid in different geographic areas that could be attributed to broad differences in various factors that included location, seasons of use, and carrying capacity or quality of range. For example, prices being paid for typical spring-summer-fall grazing on lands stocked at 1-10 acres per AUM in South Dakota were 2 to 3 times the prices paid for year-round grazing on lands in the southwestern desert areas of New Mexico, Arizona, and Nevada on lands stocked at 20 to 40 acres per AUM.

The Agencies' appraisers, in consultation with the contracted private review appraisers, concluded that the most appropriate and valid measure of the rental value of public land grazing was the average price of the negotiated leases. The value estimates were based on indications provided by the 7,246 observations of the negotiated leases. Because of the wide range of prices shown by these observations and the skewness of rental prices to the high side, they further concluded the need to remove the extremes of highs and lows in prices by excluding the top and bottom 15 percent of the reported prices. This left 70 percent of the data as the basis for estimating the fair market rental. Eliminating the extreme values at each end of the range in this manner reduced the skewness and resulted in lowering the appraised market value an average of 5 percent.

The appraisers also compared the westwide average prices paid on private leased lands to the westwide average prices paid for over 600 competitive and/or negotiated leases on approximately 9 million acres of Federal lands. The leases of Federal lands included competitive leases of military reservations, wildlife refuges, reclamation lands, and subleases of Federal grazing permits, including intermingled public and private rangelands, where all or part of the public land is administered by BLM or FS. These transactions did not involve the landowner's care or



# Map 1. Westwide Pricing Areas



B-18

**Map 1: Westwide Pricing Areas: Mature Cattle, Horses, and Yearling Cattle—Pricing Areas 1 through 6; Sheep—Entire Westwide Area**

BLM AUM's and Forest Service AM's by Pricing Area\*

Pricing Area	BLMAUMs	FS AMs	Total	Percent of total
1	196,558	194,424	390,982	2%
2	351,538	11,261	362,799	2%
3	4,352,997	2,782,956	7,135,953	33%
4	4,112,507	2,226,620	6,339,127	29%
5	4,351,845	2,673,227	7,025,072	33%
6	116,813	214,620	331,433	2%
Total	13,482,258	8,103,108	21,585,366	100%

\* Numbers of AUMs and AMs reported in the appraisal, 1982 data BLM AUMs correspond to Forest AMs.



management of the livestock. This showed an average price of \$6.53 per month for the Federal lands compared to \$6.87 for nonfederal lands, indicating a -5 percent lower value for grazing on Federal lands than for the nonfederal lands. The -5 percent difference was attributed to a number of factors, including the general conditions of the permits or leases, differences in costs of operation and desirability of use, etc.

The appraisers recommended a further adjustment because of the different payment schedules that were authorized for use on public rangeland permits/leases. The appraisal data showed that private market transactions were discounted approximately 10 percent for advance payment. Generally, both Agencies required partial or full payment in advance. The additional -10 percent adjustment together with that due to the indicated 5 percent lower market value of public grazing land leases and subleases resulted in a total -15 percent adjustment from the private grazing rates. No adjustments were made for factors such as size (in acres, AUM's, number of head), quality of range (carrying capacity or stocking rate), improvements, availability and distribution of water, etc., for the following reasons: (1) the transactions showed no difference in prices paid because of differences in these factors, and/or (2) the public rangeland allotments within each of the pricing areas exhibited broad ranges in physical characteristics and the private leased lands exhibited the same general, broad ranges in these characteristics or factors.

The mass appraisal technique assessed comparability for similar leased public and private rangelands but did not identify differences between specific leased or rented areas. The mass appraisal was, therefore, an indicator of the mean average prices paid in the market for grazing of rangelands, and was a reliable indicator of the average market value of public leased rangelands.

**Scope to the 1992 Appraisal Update.** A contract was let to David J. Lau, MAI, in association with Robert J. Mitchell, MAI, to update to January 1, 1992, the Grazing Rental Appraisal prepared for the USDA Forest Service (FS) and USDI Bureau of Land Management (BLM) as of October 1, 1983 [Fee Update Study, Appendix C]. Their efforts to update the original appraisal are based upon personal interviews with a number of Grazing lessees identified in the 1983 Grazing Rental Appraisal. They interviewed 260 pri-

vate grazing lessees in the 17 Western States that had provided information in the original report and acquired an additional 56 leases from Government agencies active in competitive grazing leasing on lands under their jurisdiction. The appraisers interviewed over 100 State and Federal officials knowledgeable in the market of grazing leases and a number of investors and professional appraisers that are active in the market place. This information was used in the analysis of current market activity, leading to conclusions as to the Private Land Leasing Rate for grazing, and resulted in an estimate of appraised value of grazing public rangeland. The value conclusions include consideration for the "conditions of use" and "terms of payment" for grazing BLM and FS lands.

## 1992 Appraisal Process and Value Conclusions

The appraisers present data reflecting the economic conditions including changes in both farmland prices and beef cattle prices over the period between 1983 and the January 1, 1992, date of the value conclusions. They conclude that there is no discernable linkage between farmland prices and grazing rental rates, but there is an industry professed linkage between beef cattle prices and the rates paid for leased grazing. The indicated number of beef cattle in the 16 Western States has dropped approximately 12.4 percent over the 1983 to 1990 time frame while prices for cattle have risen a cumulative \$19 per hundred weight or 74 percent over that same time frame. Drought and other factors have had a direct affect on grazing rates.

The appraiser concluded that the adjustments reflected in the 1983 appraisal to indicate the relationship of the private land lease rate to the "conditions of use" and terms of the public grazing permit were valid as of the January 1, 1992, date of value. They used the downward adjustment of -5 percent for the "conditions of use" of the public permit and a downward adjustment of -10 percent for the cash in advance terms, for a total downward adjustment of -15 percent to account for the conditions and terms of the public grazing permits as it relates to the private unserviced grazing leases.

The 17 Western States that are encompassed by the 1983 appraisal and current update include



Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming.

The value conclusions presented by the appraisers are consistent with the six pricing areas identified in the 1983 appraisal. The pricing units are also expressed in a consistent manner with the 1983 report, as Head-Month or Pair Month (HD-MO/PR-MO) by either mature Cattle

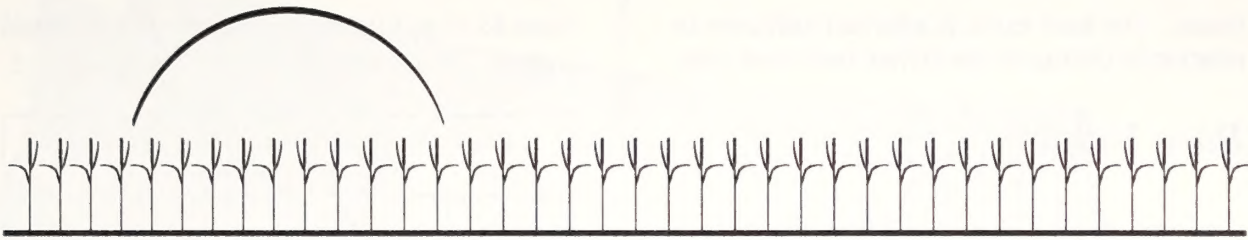
and Horses or Yearling Cattle (Under 18 months of age).

Table 6 presents for each of the six pricing areas estimates of the average private land lease rate and the estimated average appraised market value of grazing on the public rangelands, with recommended adjustments for advance payment for mature cattle and horses, yearling cattle, and the westwide price for sheep, as of January 1, 1992.

**Table 6:** Appraisal Value Conclusions (\$ Per Head or Pair Month), 1/1/92

Price Area	Appraised Market Value Private Land Lease Rate	of Grazing on Public Rangelands
<b>MATURE CATTLE &amp; HORSES (over 18 months of age)</b>		
1	\$12.00	\$10.26
2 <sup>1</sup>	\$ 7.50	\$ 6.39
3	\$ 9.00	\$ 7.74
4	\$ 7.50	\$ 6.39
5 <sup>1</sup>	\$ 5.50	\$ 4.68
6	\$ 8.00	\$ 6.85
<b>YEARLING CATTLE (Under 18 months of age)</b>		
1	\$ 9.00	\$ 7.74
2 <sup>1</sup>	\$ 6.75	\$ 5.76
3	\$ 7.00	\$ 6.03
4	\$ 6.80	\$ 5.85
5 <sup>1</sup>	\$ 5.50	\$ 4.68
6	\$ 5.60	\$ 4.77
<b>SHEEP</b>		
Westwide <sup>2</sup>	\$ 1.10	\$ 0.95
<sup>1</sup> Contract appraisers determined no change from 1983 appraised values.		
<sup>2</sup> Contract appraisers were unable to update these values due to lack of data.		





## APPENDIX C

# Rationale for the Proposed Grazing Fee Formula

*There are a number of alternative base values and alternative fee formulas that could be used to set fees for grazing on Federal lands. There have been numerous studies and much public debate as to what is a reasonable, fair, and equitable fee for grazing Federal lands.*

*There are several major considerations in establishing a Federal grazing fee. It should be based upon fair market value and comparable to fees paid for leasing private lands. The fee should provide the public a fair return for the use of public resources but should not cause significant impact to the stability of dependent Western livestock industry and communities. The fee should recover a reasonable amount of the Government's administrative costs and be reasonably easy to administer.*

*Grazing fees for the BLM and Forest Service were set on a different basis until 1969, when a new system was developed to gradually equalize fees on these two agencies' lands. In 1978, Congress passed the Public Rangelands Improvement Act (PRIA), which established a grazing fee formula to be used on a trial basis through 1985. In the absence of Congressional action to establish a new grazing fee or fee formula, the PRIA formula has been extended by Executive Order each year since 1986.*

*The proposed formula is intended to correct the disparity between rates charged for livestock forage on private and Federal land. It includes a base value which reflects the non-fee cost of operating on public land compared with private land*



leases. The base value is adjusted annually in relation to change in the private land lease rates.

## Base Value

There are two major sets of data that are reasonable estimates of the market value of Federal forage: the 1966 fee study and the 1983 grazing value appraisal. Updating these studies to 1991, the most recent year feasible, is likely to yield the two best estimates of a reasonable grazing fee.

In the 1966 Western Livestock Grazing Survey (WLGS), 10,000 individuals were interviewed to determine the nonfee costs of operating Federal lands, as compared with operating on private land leases. Information on the private land lease rate was also collected. The WLGS determined that the westwide value for grazing Federal lands equalled \$1.23 per animal unit month (AUM) for 1966. Updating the \$1.23 to 1991 by the change in the private land lease rate index results in a westwide value of \$3.25 per AUM. This value accounts for the nonfee cost differences of leasing private as compared with public lands.

The second major set of data is the 1983 appraisal of the value of grazing on the BLM and Forest Service administered lands in 16 Western States (Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Utah, Washington, and Wyoming). This appraisal involved data collected on approximately 100,000 leases and generated 7,246 useable records of fees paid for livestock grazing. The appraisal divided the 16 States into six pricing regions. The appraisers concluded that the value of public land grazing varied from \$4.68 per head month in the lowest value region (the Southwest) to \$8.55 per head month in the highest value region (the Northern Plains).

In May 1992, the BLM and the Forest Service submitted an update of the 1983 appraisal to Congress. The update, based on additional data for private grazing lease rates gathered during 1991, found no change in the value of grazing in the lowest value region. The 1991 appraised value of public land grazing varied from \$4.68 per head month in the Southwest to \$10.26 per head month in the Northern Plains. Table 1 reflects this appraisal range for the six western regions. As indicated, the values would range

from \$5.05 to \$11.08 based on the 1993 appraisal update. The six regions are depicted on Map 1.

**Table 1: Appraised Market Value of Grazing on Public Rangeland.**

Region	1991	1993 (Projected)
1	\$10.26	\$11.08
2	6.39	6.90
3	7.74	8.36
4	6.39	6.90
5	4.68	5.05
6	6.85	7.40

The Southwest contains 33 percent of the total livestock AUM's on BLM and Forest Service lands. The maximum westwide grazing fee that can be collected without exceeding the appraised value for a significant portion of BLM and Forest Service grazing is \$4.68 per AUM. Any higher fee would exceed the appraised value for grazing in the Southwest.

There is no clear empirical basis for choosing between these two fee updates. The Department of the Interior/Department of Agriculture Economic Analysis Group recommended to the Secretaries that *a base value be set that represented the mid-point in the range of these two major alternatives. The average of \$3.25 (WLGS) and \$4.68 (Westwide appraisal) per AUM yields a 1991 base value of \$3.96 per AUM.*

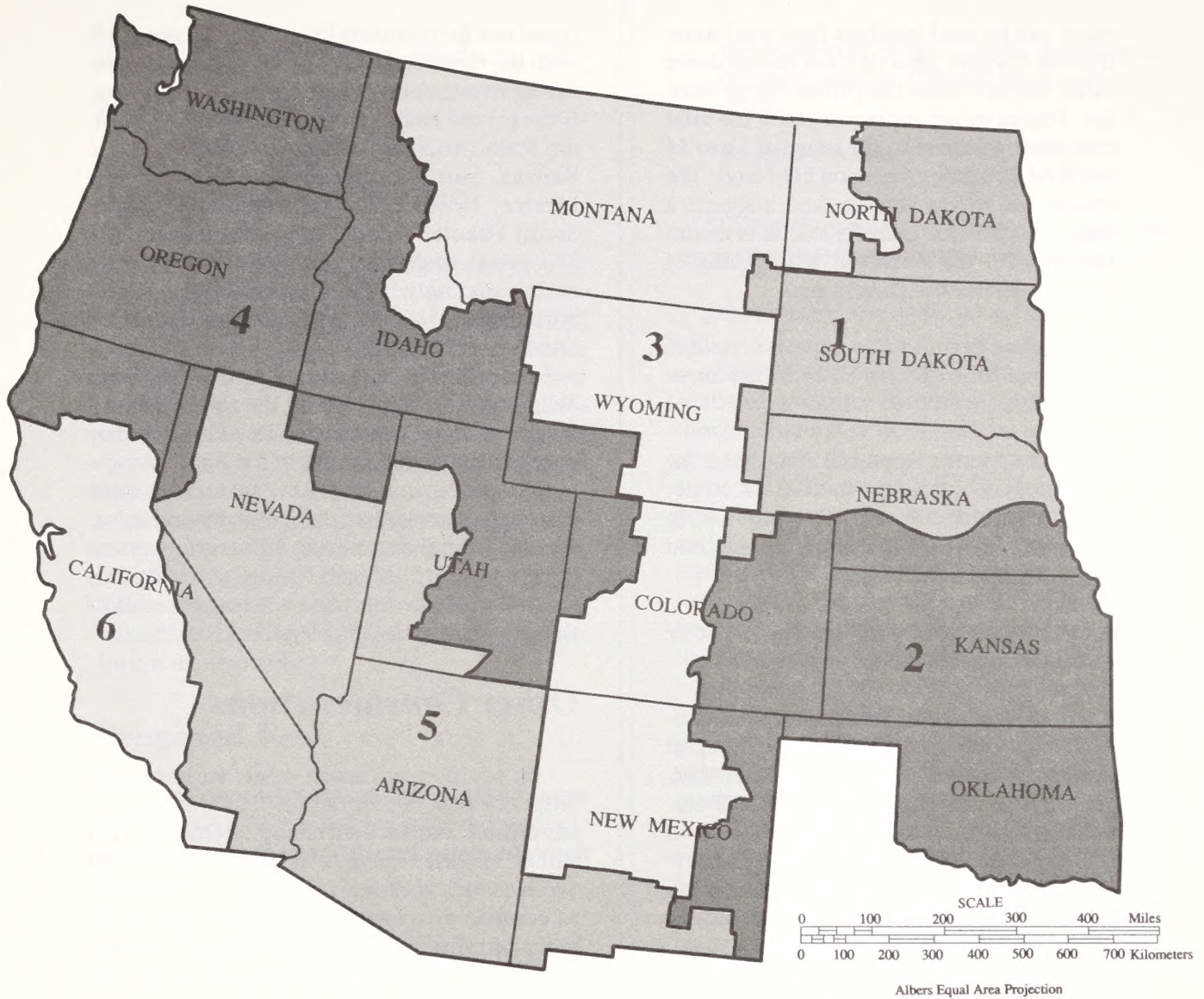
The \$3.96 per AUM value is consistent with the findings and recommendations of the 1993 unpublished study conducted by the Grazing Fee Task Force (GFTF) as part of the Incentive Based Grazing Fee Task Force Study. The GFTF included economists from four universities, an economist from the Forest Service, and three appraisers from the BLM. The GFTF studied several methods for determining public land forage values. The methods include comparison of private forage market values with public land forage values, using the total cost approach which considers the difference between grazing costs on public and private land; a market appraisal approach; a statistical analysis of private leases; and a grazing permit value approach. The studies were conducted in Wyoming, Idaho, and New Mexico.

The major findings of this study include:

1. Total cost valuations yielded inconsistent results. The cost analysis demonstrated that



# Map 1. Westwide Pricing Areas





many public land ranchers have paid more in total costs for grazing than the apparent value implied from the private forage market. Forage values estimated using the total cost approach were in the range of \$3 to \$4 per AUM for cattle grazing on BLM land. The results for Forest Service land suggests a negative value for grazing, which is inconsistent with the observed willingness of ranchers to pay the current fee.

2. The grazing permit value approach yielded a range of \$3 to \$5 per AUM in the three test States.
3. Using the Market Appraisal Approach, the estimated 1992 forage value was \$3.40 per AUM in New Mexico and \$7.19 per AUM in Wyoming. (An appraisal using this method was not made in Idaho.)
4. A market statistical analysis would not be possible for public lands.

The GFTF concluded that the value of public land forage does not differ in the three test States, with a value of between \$3 to \$5 per AUM. In keeping with this conclusion, the GFTF recommended that the fee should be set between \$3 to \$5 per AUM. The assessment relies heavily on the values implied from grazing permit values that provide a direct estimate of ranchers' willingness to pay.

In addition, it should be noted that the actual grazing fee in 1980 was \$2.36 per AUM on BLM administered lands and \$2.41 per AUM on Forest Service lands administered (the two agencies did not have the same fee until 1981). Updated for the general rate of inflation in the U.S. economy over the period 1980 to 1993, the 1980 fee, expressed in constant 1991 dollars, was equal to \$3.85 per AUM for BLM administered lands and \$3.93 per AUM for Forest Service administered lands. Therefore, the base fee in 1991 of \$3.96 would be almost the same as the fee charged by the BLM and the Forest Service in 1980.

## *Forage Value Index*

The proposed fee formula would index the base value by the Forage Value Index. The FVI is derived by comparing the current years annual

rental rate for pasturing livestock in private lands with the three year (1990-1992) average for pasturing livestock on private lands. In the future, if the private land lease rate changes in 17 Western States (Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming), the Federal grazing fee would change correspondingly. The fee would be adjusted annually in relationship to the private land lease rate market.

Indexing the base value by only the Forage Value Index is supported by the conclusions of Incentive Based Grazing Fee Task Group. They concluded that the indexes in the Public Rangeland Improvement Act (PRIA) fee formula have caused the grazing fee to fall behind forage value. A 1991 General Accounting Office study essentially concluded the same thing by stating that the "relative low fees are an inherent result of the existing formula's design."

## *Other Considerations*

In addition to market value, an important criterion for a fee formula is that it be easy to administer and to understand. One fee that can be applied westwide to all BLM and Forest Service lands is easiest to administer especially as compared to charging different fees by region, carrying capacity or some other variable basis. Indexing the base value by one index, the private land lease rate, is also easy to administer and generally understandable.

The fee level should also help stabilize the Western livestock industry. A base level of \$3.96 meets this criterion, since it is lower than the lowest regional appraisal value of the 1992 update of the 1983 appraisal. It is proposed that the fee would not vary more than 25 percent from the previous year's fee, which would limit year-to-year impacts. In addition, the proposed fee would cover most of the cost of the range program provided the demand for forage is sustained at the higher fee.

Finally, a number of other alternatives covering a wide range of methodologies were evaluated as a means to establish a new base value and grazing fee. These alternatives and others that may be submitted during public comment periods will be reflected and analyzed in the Draft Environmental Impact Statement.



# The Proposed Fee and Phase-In

## Appropriate Fee Range

The initial fee methodologies analyzed by the Departments of the Interior and Agriculture would result in a 1993 grazing fee range of \$3.51 to \$9.39. This range excludes the current fee formula, which has resulted in a fee far below market value. It also excludes a regional fee structure, also evaluated, which would result in fees as high as \$11.08 for 1993 in the Northern Great Plains.

The analysis clearly pointed to an appropriate range of \$3.51 to \$5.05 for a 1993 base fee. It is this range which became the focus of further analysis. The mid-point within this range was selected to serve as a basis for establishing a future fee structure.

## Proposed Fee

Consistent with the above described range of \$3.51 to \$5.05, the Secretary of the Interior is seeking comments on the following proposed formula:

$$\text{Grazing Fee per AUM} = \$3.96 \times \text{Forage Value Index}$$

Grazing fee = the fee determined by the Secretary to be reasonable and equitable to the United States and to the holders of grazing permits and leases.

\$3.96 = The base value established for 1991 by averaging \$3.25 and \$4.68.

FVI = "Forage Value Index" is the weighted average estimate (weighted by Federal AUM's) of the annual rental charge per AUM for pasturing cattle on private rangelands in 17 contiguous Western States (current value) divided by \$8.67 (average for the years 1990, 1991, and 1992). The \$8.67 is the average of the weighted average of the 1990 value of \$8.31, the 1991 value of \$8.31 and the 1992 value of \$9.39. The current 17-State weighted average value is determined by

weighing each of the 17 States' private grazing land lease rate (PGLLR) by its respective AUM's.

$$\text{Forage Value Index} = \frac{\$9.39}{\$8.67} = 1.08$$

Using the proposed grazing fee formula, the fee for the 1993 grazing season would have been:

$$\text{1993 Grazing Fee} - \$3.96 \times 1.08 = \$4.28$$

The Proposed Action would establish 1996 as the base year for the forage value index. The forage value index would not be used to annually adjust the fee in response to market conditions until the year 1997. This proposed rule would establish the 1995 grazing fee at \$2.75, and the 1996 grazing fee at \$3.50. Thereafter the fee would be calculated, except as provided below, using the base value of \$3.96 multiplied by the revised forage value index. By definition, the forage value index in the year 1996 would equal one; yielding a 1997 grazing fee of \$3.96. In subsequent years the calculated fee would depend on the changes in the market rate for private grazing land leases as reflected by the forage value index.

This change in the derivation of the forage value index is proposed to reduce the uncertainty in the fee in the immediate future that resulted from using a forage value index based on less current private land lease rate data. Under the proposal presented in the advance notice of proposed rulemaking, the fee would have been adjusted annually by a forage value index based on the average price paid for private grazing in the years 1990 through 1992. Assuming that forage value index would have remained constant until the end of the phase-in period provided in the advance notice, the formula would have yielded a grazing fee of \$4.28 per AUM as compared to a 1997 fee of \$3.96 per AUM using the revised forage value index.

Other grazing fee formula options considered in developing this proposal are discussed in detail in the Draft Environmental Impact Statement, as indicated above.

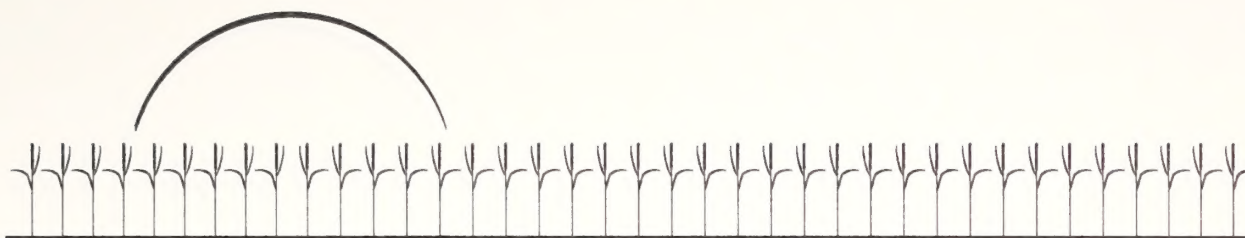
## Phased Implementation

The new fee structure would be phased in over 3 years. See proposed rule for details.









# APPENDIX D

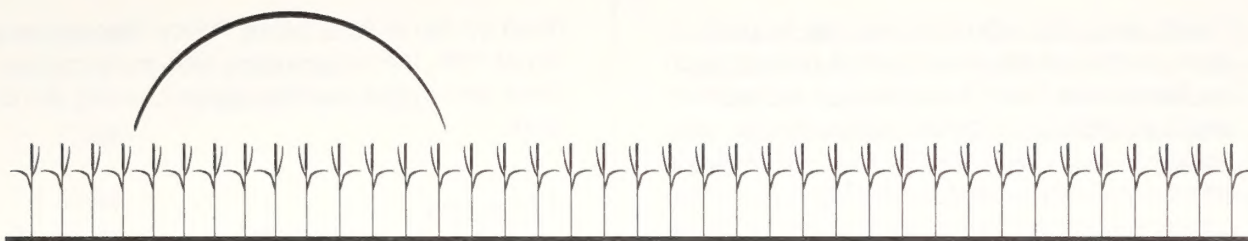
## Private Grazing Land Lease Rates

State	Operational AUM (Includes Cow-Calf)					
	1987	1988	1989	1990	1991	1992
AZ	7.19	4.47	3.92	u	u	5.53
CA	8.46	9.43	10.72	9.81	9.61	10.09
CO	8.27	8.43	8.39	10.20	9.30	10.11
ID	6.60	6.99	6.93	8.42	10.18	9.49
KS	8.87	9.42	10.13	10.58	11.10	10.99
MT	7.94	9.79	9.61	9.61	10.58	11.86
NE	10.29	10.40	13.13	15.78	14.83	14.83
NV	7.31	u	4.18	u	9.45	10.26
NM	5.82	5.46	7.51	6.66	3.02	6.95
ND	7.41	7.67	8.26	8.52	8.93	10.04
OK	5.68	6.09	9.94	4.31	7.23	6.58
OR	5.91	7.03	7.40	8.28	8.93	9.28
SD	8.61	9.98	10.65	12.53	12.74	12.44
TX	8.30	8.06	9.37	7.61	8.60	8.92
UT	5.98	8.70	9.06	7.79	9.64	9.79
WA	9.55	7.28	7.94	7.82	7.81	10.69
WY	6.31	8.93	10.06	9.64	9.98	9.93
<b>Regional averages are weighted by public AUMs.</b>						
17	6.94	u	7.75	8.31	8.31	9.39
16	6.94	u	7.74	8.32	u	9.39
11	6.86	u	7.61	8.16	u	9.26
9	6.78	7.63	8.84	8.89	7.58	9.14
u = unpublished State survey rates or Region to avoid disclosure of private proprietary lease rates.						
<b>1990-92 average (17 - State) = 8.67</b>						
Source: USDA, National Agricultural Statistics Service						









## APPENDIX E

### Description of Grazing Fee Alternatives Submitted by:

*Western Livestock Producers Alliance  
"Federal Forage Fee Formula" (Alternative 5)  
and High Country Citizens' Alliance  
"The Gunnison Basin Grazing Fee Reform  
Proposal" (Alternative 6)*

*Federal Forage Fee Formula  
Narrative Description  
July 28, 1993*

E-1

*The Federal Forage Fee Formula is based on the premise that the western public lands grazing permittee should pay the fair value of the forage received from federal lands.*

*Two objectives were met in determining the formula for a forage value-based grazing fee: (1) identification of the value of raw forage as a percentage of the private land lease rate (Private Lease Forage Value Ratio); and (2) an adjustment which reflects the lower animal production derived from federal lands compared to private lands (Net Production Differential), and the additional costs of doing business on federal lands compared to private lands (Non Fee Cost Differential)(e.g., additional infrastructure and operational costs). Because the costs associated with cattle production vary from those of sheep production, sheep costs are figured into the Non Fee Cost Differential (80% cattle, 20% sheep).*



Simply put, the federal forage fee formula is based on the private forage market while reflecting the unique costs of production and relative inefficiencies of harvesting federal forage compared to private land operations. A reasonable grazing fee must reflect the higher operational costs and lower animal production derived from federal lands and, as such, would promote similar economic opportunity between federal land and private land livestock producers.

The private land lease rate is weighted by the proportional number of federal AUMs in each of the 16 western states. The rolling three year weighted average of the private land lease rate is used in order to minimize the high and low extremes of the lease scale. This lease rate is calculated on a weighted average of private lease rates for non-irrigated native rangelands.

The value of the forage component of private land leases, as determined in a comprehensive 1966 grazing fee study and carried through in the 1992 update of the *Grazing Fee Review and Evaluation* report is 48.8% of the total private land lease rate. The remaining 51.2% of the private lease rate includes infrastructure and services associated with a private land lease.

The Non Fee Cost Differential of the federal forage fee formula is based on the updated analysis of non-fee costs adjusted annually for inflation. This number indicates that for 1991 it cost \$1.60 more per AUM to operate on federal lands than private lands.

The Net Production Differential of the formula is based on Economic Research Service comparisons of cash livestock receipts from both western federal land ranches and non-federal land ranches which show that, overall, the federal lands generate 12.1% less revenue per animal unit than private lands (thus, the 87.9% figure).

Every figure in the federal forage fee formula is derived from economic data compiled and updated by federal agencies.

Research using historical data reveals that the Federal Forage Fee yields a more predictable fee than PRIA, which has fluctuated from a high of \$2.41 to a low of \$1.35 (a 78% variance) over its 15-year life. A 25% cap on any increase or decrease in the fee from year to year, starting with the current fee is maintained. Additionally, the federal forage fee formula adheres to the guidelines Congress established for determination of federal grazing fee policy as out-

lined by the Federal Lands Policy Management Act of 1976, the Independent Offices Appropriations Act of 1952 and the Taylor Grazing Act of 1934.

## Figures

**Weighted Average Private Land Lease Rate = \$8.77 (WAPLLR)**

*Derived from 16-state weighted average private land lease rate as surveyed by the U.S. Department of Agriculture's Economic Research Service (ERS) and adjusted for the number of federal AUMs in each state. The calculation is a rolling average of the three most recent years' data.*

**Private Land Forage Value Ratio = 48.8% (PrLFVR)**

*Grazing Fee Review and Evaluation, DOI & USDA 1992, pgs. 18 and 22. Determines the forage component of the WAPLLR.*

**Non Fee Cost Differential = \$1.60 (NFCD)**

*Grazing Fee Review and Evaluation, DOI & USDA 1992, pg. 58, Appendix A.1: Updated by Input Cost Index (ICI) for currency. Deduction to reflect additional costs per AUM incumbent with federal land grazing.*

**Net Production Differential = 87.9% (NPD)**

*Grazing Fee Review and Evaluation, DOI & USDA 1992, pg. 53, "Equity Among Livestock Producers." Adjustments to reflect lower animal production derived from federal grazing lands.*

## Formula/Calculations

$$\begin{aligned}
 & ((\text{WAPLLR} \times \text{PrLFVR}) - \text{NFCD}) \\
 & \quad \times \text{NPD} = \text{FFF} \\
 \\ 
 & \$8.77 \quad \text{Weighted Average Private Land} \\
 & \quad \text{Lease Rate (WAPLLR)} \\
 & \times 48.8\% \quad \text{Private Lease Forage Value Ratio} \\
 & \quad \text{(PrLFVR)} \\
 & = \$4.28 \quad \text{Private Lease Forage Value}
 \end{aligned}$$



	\$4.28	
-	\$1.60	Non Fee Cost Differential (NFCD)
=	\$2.68	
	\$2.68	
x	87.9%	Net Production Differential (NPD)
=	\$2.36	Federal Forage Fee (Grazing Fee) (FFF)

The effective Federal Forage Fee would be \$2.33 in the first year after applying the 25% cap to the current grazing fee.

## ***The Gunnison Basin Grazing Fee Reform Proposal***

The substantive outcome of the working group's effort is contained in this Part VI. This proposal was developed as a proactive, progressive middle ground approach to the issues. It breaks new ground in several key areas. Central to the proposal is the notion that local administration with local oversight will free both the agencies and the grazing permittees to be better, more efficient, and more responsible stewards of the public's range resources. The proposal includes an element that provides a direct return to the United States Treasury. It works, within limits encompassing the permittees' ability to pay, to meet localized administrative costs of the grazing program. The Gunnison Proposal recognizes the one underlying truth about grazing livestock in the 16 western states: ALL AREAS OF THE WESTERN UNITED STATES ARE DIFFERENT, WITH DIFFERENT FORAGE RESOURCES, AND DIFFERENT ECOLOGICAL CONDITIONS. LEGITIMATE DIFFERENCES IN VALUES OF THOSE RESOURCES EXIST, AND WITHIN LIMITS, DIFFERENT COSTS OF ADMINISTERING THE FEDERAL GRAZING PROGRAM MAY BE JUSTIFIED. If adopted westwide, the potential for an increase of revenue from the grazing program on the order of \$25-30 million is possible.

In overview, the Gunnison Basin Proposal is to allow the formula announced in the Public Rangelands Improvement Act of 1978 to continue to operate as a base fee, upon which is

added a capped surcharge as a separate line in a permittee's Bill for Collection. This surcharge would be based on the costs of administering the program locally on an AUM basis, plus a percentage as a direct return to the Treasury. Authority for the imposition of the surcharge would lie with a newly created Local Rangeland EcoSystem Advisory Councils. These councils would have new, broad oversight authority at the National Forest and BLM District level. In addition, the Gunnison Basin Proposal would provide for an expansion of existing authority for RBF funds to be used for allotment management planning during FY 94,95, and 96. Finally, the Proposal includes development of a joint comprehensive educational program targeted at permittees, agency personnel, range riders, and interested publics.

The specifics of the proposal are:

### **1. UTILIZE PRIA AS THE BASE FEE.**

1.a. Continue the use of the formula enacted in the Public Rangelands Improvement Act of 1978 (Public Law 95-514) and extended by Executive Order 12548, dated February 14, 1986, as a base fee charged to all livestock operators grazing domestic livestock on the federal rangelands.

1.b. Continue the floor level set in the Executive Order for purposes of this base at \$1.35/AUM.

1.c. Continue the limitation on annual increases or decreases in the base fee to not more than 25 percent of the previous year's base fee.

### **2. IMPOSE A CAPPED LOCAL ADMINISTRATIVE SURCHARGE.**

2.a. In addition to the PRIA base fee, impose, as a separate line item in the grazing Bill for Collection sent to every grazing permittee, a surcharge, identified as such, on a per AUM basis tied directly to the costs of administering grazing at the local level.

2.b. Determine and impose the surcharge at the BLM District and National Forest



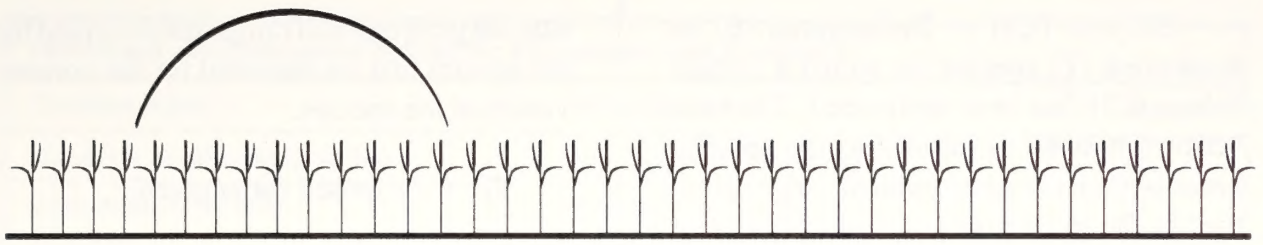
level in the agencies. Surcharge could and would vary from National Forest to National Forest and from BLM District to BLM District.

- 2.c. Administrative costs recoverable with the surcharge upon BLM permittees and lessees would be those costs incurred in the rangeland management program specifically attributable to livestock grazing at the BLM District level or below.
- 2.d. Administrative costs recoverable with the surcharge would be those costs incurred in the rangeland management program specifically attributable to livestock grazing at the Forest (SO) level in the National Forest System or below.
- 2.e. As a direct financial incentive to decentralize management and drive funding closer to the field administrative units, administrative costs incurred in the rangeland management program at the State and Washington level of the BLM or the Regional and Washington level of the Forest System would not be recoverable through the surcharge.
- 2.f. CAP THE SURCHARGE AS A MEANS OF CONTROLLING ADMINISTRATIVE COSTS at 100% of the PRIA base formula in any given year. (Example: 1993 PRIA @ \$1.86/AUM. Administrative surcharge could not exceed and additional \$1.86/AUM; maximum Bill for Collection possible would be \$3.72/AUM.
- 2.g. Waive the 25% limitation on an increase in the total grazing fee for one year and

step up immediately to the capped surcharge in calendar year 1994 based on FY 1993 costs attributable to livestock grazing at the local level.

- 2.h. After calendar year 1994, impose a 10% restriction in the annual rate of increase or decrease in the surcharge.
- 3. **CHANGE ELEMENTS OF THE DISTRIBUTION OF GRAZING FEE RECEIPTS BY CHARGING A SINGLE, DIRECT, IDENTIFIABLE RETURN TO THE UNITED STATES TREASURY.**
  - 3.a. Remove the requirement that the Forest Service return 25% of its grazing fee receipts to the U.S. Treasury.
  - 3.b. Amend the Taylor Grazing Act to eliminate the requirement that 37.5 % of the receipts from Section 3 permits go to the U.S. Treasury.
  - 3.c. Impose a direct charge tied to the annual average market rate of 10-year U.S. Treasury Bonds upon the total fee.
- 4. **BILL FOR, COLLECT, AND RETAIN THE GRAZING FEE REVENUES AT THE LOCAL LEVEL.**
  - 4.a. Allow the local administrative units to collect the fee and retain that revenue less the direct payment required to the United States Treasury. Allow charging a small availability fee (\$.10/AUM) for non-use because of permittee convenience.





## APPENDIX F

# Threatened and Endangered Species

*This appendix presents the federally designated endangered, threatened, and proposed species. Information is based on the most current published status when this document went to press: 50 CFR 17.11 and 17.12, Endangered & Threatened Wildlife and Plants, August 23, 1993. The status of any species may have changed before publication of the Final EIS, including the addition of new species. Current status should always be confirmed with a local Fish and Wildlife Service office. Plant species are alphabetized by scientific name to preserve the generic relationships for species lacking known common names.*

*Species on the following list occur on public or Forest Service lands on or near areas that are grazed by livestock. Many of the species listed may be affected by livestock grazing either adversely or beneficially, either directly or indirectly, and some may not be affected at all. Some of the species may occur in ungrazed areas.*

*The symbols used in this table are as follows:*

*E = Endangered Species. Any species which is in danger of extinction throughout all or a significant portion of its range.*

*T = Threatened Species. Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.*



ECH & TCH = Endangered (E) or threatened (T) species for which a critical habitat (CH) has been designated. The term "critical habitat" is defined as the specific areas within the geographical range occupied by the species on which are found those physical or biological features essential to the conservation of the species and which may require special management considerations or protection; and specific areas out-

side the geographical rangeland occupied by the species that are essential for the conservation of the species.

PE = Proposed endangered.

PT = Proposed threatened.

PCH = Proposed critical habitat.

Threatened and Endangered Species for All Analysis Units Combined		
Common Name	Scientific Name	Status
<b>Mammals</b>		
Bat, Mexican Long-nosed	<i>Leptonycteris nivalis</i>	E
Bat, Lesser Long-nosed (Sanborn's)	<i>Leptonycteris yerbabuenae</i>	E
Bear, Grizzly or Brown	<i>Ursus arctos horribilis</i>	T
Caribou, Woodland	<i>Rangifer tarandus caribou</i>	E
Deer, Columbian White-tail	<i>Odocoileus virginianus leucurus</i>	E
Ferret, Black-footed	<i>Mustela nigripes</i>	E
Jaguarundi	<i>Felis yagouaroundi tolteca</i>	E
Rat, Giant Kangaroo	<i>Dipodomys ingens</i>	E
Rat, Stephen's Kangaroo	<i>Dipodomys stephensi</i>	E
Rat, Tipton Kangaroo	<i>Dipodomys nitratoides</i>	E
Fox, San Joaquin Kit	<i>Vulpes macrotis mutica</i>	E
Beaver, Point Arena Mountain	<i>Aplodontia rufa</i>	E
Ocelot	<i>Felis pardalis</i>	E
Prairie Dog, Utah	<i>Cynomys parvidens</i>	T
Pronghorn, Sonoran	<i>Antilocapra americana sonoriensis</i>	E
Squirrel, Mount Graham Red	<i>Tamiasciurus hudsonicus grahamensis</i>	E
Vole, Hualapai Mexican	<i>Microtus mexicanus hualpaiensis</i>	E
Wolf, Gray	<i>Canis lupus</i>	E
<b>Birds</b>		
Condor, California	<i>Gymnogyps californianus</i>	ECH
Crane, Whooping	<i>Grus americana</i>	ECH
Curlew, Eskimo	<i>Numenius borealis</i>	E
Eagle, Bald	<i>Haliaeetus leucocephalus</i>	E (T in OR/WA)
Falcon, American Peregrine	<i>Falco peregrinus anatum</i>	E
Falcon, Northern Aplomado	<i>Falco femoralis septentrionalis</i>	E



<b>Threatened and Endangered Species for All Analysis Units Combined</b>		
<b>Common Name</b>	<b>Scientific Name</b>	<b>Status</b>
Flycatcher, Southwestern Willow	<i>Empidonax trailii extimus</i>	PE
Gnatcatcher, California	<i>Polioptila californica californica</i>	T
Goose, Aleutian Canada	<i>Branta canadensis leucopareia</i>	T
Murrelet, Marbled	<i>Brachyramphus marmoratus marmoratus</i>	T
Owl, Mexican Spotted	<i>Strix occidentalis lucida</i>	T
Owl, Northern Spotted	<i>Strix occidentalis courina</i>	T
Parrot, Thick-billed	<i>Rhynchopsitta pachyrhyncha</i>	E
Pelican, Brown	<i>Pelecanus occidentalis</i>	E
Plover, Piping	<i>Charadrius melodus</i>	E(T in WEST)
Plover, Western Snowy	<i>Charadrius alexandrinus nivosus</i>	T
Rail, Yuma Clapper	<i>Rallus longirostris yumanensis</i>	E
Tern, California Least	<i>Sterna antillarum browni</i>	E
Tern, Least	<i>Sterna antillarum</i>	E
Vireo, Least Bell's	<i>Vireo bellii pusillus</i>	E
<b>Fishes</b>		
Chub, Bonytail	<i>Gila elegans</i>	E,PCH
Chub, Borax Lake	<i>Gila boraxobius</i>	E
Chub, Chihuahua	<i>Gila nigrescens</i>	T
Chub, Humpback	<i>Gila cypha</i>	E,PCH
Chub, Hutton Tui	<i>Gila bicolor ssp.</i>	T
Chub, Owens tui	<i>Gila bicolor snyderi</i>	E
Chub, Pahrangat Roundtail	<i>Gila robusta jordani</i>	E
Chub, Sonora	<i>Gila ditaenia</i>	TCH
Chub, Virgin River	<i>Gila robusta semidnuda</i>	E
Dace, Ash Meadows Speckled	<i>Rhinichthys osculus nevadensis</i>	ECH
Dace, Clover Valley Speckled	<i>Rhinichthys osculus oligoporus</i>	E
Dace, Desert	<i>Eremicmhtys acros</i>	TCH
Dace, Foskett Speckled	<i>Rhinichthys osculus</i>	T
Dace, Moapa	<i>Moapa coriacea</i>	E
Gambusia, Pecos	<i>Gambusia nobilis</i>	E
Minnow, Loach	<i>Tiaroga cobitis</i>	TCH
Poolfish (Killifish), Pahump	<i>Empetrichthys latos</i>	E
Pupfish, Ash Meadows Amargosa	<i>Cyprinodon nevadensis mionectes</i>	ECH
Pupfish, Desert	<i>Cyprinodon macularius</i>	ECH



<b>Threatened and Endangered Species for All Analysis Units Combined</b>		
<b>Common Name</b>	<b>Scientific Name</b>	<b>Status</b>
Pupfish, Devil's Hole	<i>Cyprinodon diabolis</i>	E
Pupfish, Owens	<i>Cyprinodon radiosus</i>	E
Pupfish, Warm Springs	<i>Cyprinodon nevadensis pectoralis</i>	E
Salmon, Klamath spring, Sacramento Winter Chinook	<i>Oncorhynchus tshawytscha</i>	T
Salmon, Snake River Sockeye	<i>Oncorhynchus nerka</i>	E
Salmon, Snake River Fall Chinook	<i>Oncorhynchus tshawytscha</i>	T
Salmon, Snake River Spring/Summer Chinook	<i>Oncorhynchus tshawytscha</i>	T
Shiner, Beautiful	<i>Cyprinella (Notropis) formosa</i>	TCH
Shiner, Pecos Bluntnose	<i>Notropis simus pecosensis</i>	TCH
Spikedace	<i>Meda fulgida</i>	TCH
Spinedace, Big Spring	<i>Lepidomeda mollispinis pratensis</i>	TCH
Spinedace, Little Colorado River	<i>Lepidomeda vittata</i>	T
Spinedace, White River	<i>Lepidomeda albivallis</i>	ECH
Springfish, Hiko White River	<i>Crenichthys baileyi grandis</i>	ECH
Springfish, Railroad Valley	<i>Crenichthys nevadae</i>	TCH
Springfish, White River	<i>Crenichthys baileyi baileyi</i>	ECH
Squawfish, Colorado River	<i>Ptychocheilus lucius</i>	XN <sup>1</sup> , E,PCH
Stickleback, Unarmored Threespine	<i>Gasterosteus aculeatus williamsoni</i>	E
Sturgeon, Pallid	<i>Scaphirhynchus albus</i>	E
Sucker, June	<i>Chasmistes liorus</i>	ECH
Sucker, Lost River	<i>Deltistes luxatus</i>	E
Sucker, Klamath Largescale	<i>Catostomus snyderi</i>	E
Sucker, Modoc	<i>Catostomus microps</i>	ECH
Sucker, Razorback	<i>Xyrauchen texanus</i>	E,PCH
Sucker, Shortnose	<i>Chasmistes brevirostris</i>	ECH
Sucker, Warner	<i>Catostomus warnerensis</i>	T
Topminnow, Gila (incl. Yaqui)	<i>Poeciliopsis occidentalis</i>	E
Trout, Apache	<i>Oncorhynchus (= Salmo) apache</i>	T
Trout, Gila	<i>Oncorhynchus (= Salmo) gilae</i>	E
Trout, Greenback Cutthroat	<i>Oncorhynchus clarki stomias</i>	T
Trout, Lahontan Cutthroat	<i>Oncorhynchus clarki henshawi</i>	TCH
Trout, Little Kern Golden	<i>Oncorhynchus aguabonita whitei</i>	TCH
Trout, Paiute Cutthroat	<i>Oncorhynchus clarki seleniris</i>	TCH
Woundfin	<i>Plagopterus argentissimus</i>	E,XN <sup>1</sup>



<b>Threatened and Endangered Species for All Analysis Units Combined</b>		
<b>Common Name</b>	<b>Scientific Name</b>	<b>Status</b>
<b>Reptiles</b>		
Lizard, Blunt-nosed Leopard	<i>Gambelia silus</i>	E
Rattlesnake, New Mexican Ridge-nosed	<i>Crotalus willardi obscurus</i>	TCH
Toad, Wyoming	<i>Bufo hemiophrys baxteri</i>	E
Tortoise, Desert (Mojave)	<i>Gopherus agassizii</i>	TCH
<b>Insects</b>		
Beetle, American Burying (=Giant Carrion Beetle)	<i>Nicrophorus americanus</i>	E
Beetle, Valley Elderberry Long-horn	<i>Desmocerus californicus dimorphus</i>	T
Butterfly, Oregon Silverspot	<i>Speyeria zerene hippolyta</i>	T
Butterfly, Smith's Blue	<i>Euphilotes enoptes smithi</i>	E
Moth, Kern Primrose Sphinx	<i>Euproserpinus euterpe</i>	T
Naucorid, Ash Meadows	<i>Ambrysus amargosus</i>	TCH
<b>Crustaceans and Mollusks</b>		
Crayfish, Shasta	<i>Pacifastacus fortis</i>	E
Isopod, Socorro	<i>Thermosphaeroma thermophilus</i>	E
Shrimp, Longhorn Fairy	<i>Branchinecta longiartenna</i>	PE
Shrimp, Vernal Pool Fairy	<i>Branchinecta lynchi</i>	PE
Springsnail, Bruneau Hot	<i>Pyrgulopsis bruneauensis</i>	E
<b>Plants</b>		
Agave, Arizona	<i>Agave arizonica</i>	E
Blue-star, Kearney's	<i>Amsonia kearneyana</i>	E
Bear-poppy, Dwarf	<i>Arctomecon humilis</i>	E
Manzanita, Morro	<i>Arctostaphylos morroensis</i>	PE
Prickly-poppy, Sacramento	<i>Argemone pleiacantha ssp. pinnatisecta</i>	E
Milkweed, Welsh's	<i>Asclepias welshii</i>	TCH
Milk-vetch, Applegate's	<i>Astragalus applegatei</i>	E
Milk-vetch, Braunton's	<i>Astragalus brauntonii</i>	PE
Milk-vetch, Sentry	<i>Astragalus cremnophylax</i> var. <i>cremnophylax</i>	E
Milk-vetch, Mancos	<i>Astragalus humillimus</i>	E
Milk-vetch, Sodaville	<i>Astragalus lentiginosus</i> ssp. <i>sesquimetalis</i>	PT
Milk-vetch, Heliotrope	<i>Astragalus montii</i>	T
Milk-vetch, Osterhout	<i>Astragalus osterhoutii</i>	E



**Threatened and Endangered Species for All Analysis Units Combined**

Common Name	Scientific Name	Status
Milk-vetch, Ash Meadows	<i>Astragalus phoenix</i>	TCH
Camissonia, Atwood's	<i>Camissonia atwoodii</i>	T
Primrose, San Benito Evening	<i>Camissonia benitensis</i>	T
Clover, Fleshy Owl's	<i>Castilleja campestris</i> ssp. <i>succulenta</i>	PT
Jewelflower, California	<i>Caulanthus californicus</i>	E
Centaury, Spring-loving	<i>Centaurium namophilum</i> var. <i>namophilum</i>	TCH
Spurge, Hoover's	<i>Chamaesyce hooverii</i>	PT
Thistle, Chorro Creek Bog	<i>Cirsium fontinale</i> obispoense	PE
Thistle, Sacramento Mountains	<i>Cirsium vinaceum</i>	T
Cactus, Cochise Pincushion	<i>Coryphantha robbinsorum</i>	T
Cactus, Sneed Pincushion	<i>Coryphantha sneedi</i> var. <i>sneedii</i>	E
Cactus, Lee Pincushion	<i>Coryphantha sneedii</i> var. <i>leei</i>	T
Cycladenia, Jones	<i>Cycladenia humilis</i> var. <i>jonesii</i>	T
Biscuit Root, Higgin's	<i>Cymopterus higginsii</i>	T
Dudley, Verity's	<i>Dudleya verityi</i>	PT
Cactus, Nichol's Turk's Head	<i>Echinocactus horizonthalonius</i> var. <i>nicholii</i>	E
Cactus, Kuenzler Hedgehog	<i>Echinocereus fendleri</i> var. <i>kuenzleri</i>	E
Cactus, Lloyd's Hedgehog	<i>Echinocereus lloydii</i>	E
Cactus, Arizona Hedgehog	<i>Echinocereus triglochidiatus</i> var. <i>arizonicus</i>	E
Cactus, Spineless Hedgehog	<i>Echinocereus triglochidiatus</i> var. <i>inermis</i>	E
Sunray, Ash Meadows	<i>Enceliopsis nudicaulis</i> var. <i>corrugata</i>	TCH
Mallow, Kern	<i>Eremalche kernensis</i>	E
Wooly-star, Hoover's	<i>Eriastrum hooveri</i>	T
Daisy, Maguire	<i>Erigeron maguirei</i> var. <i>maguirei</i>	E
Fleabane, Rhizome	<i>Erigeron rhizomatus</i>	T
Wild-buckwheat, Gypsum	<i>Eriogonum gypsophilum</i>	TCH
Buckwheat, Steamboat	<i>Eriogonum ovalifolium</i> var. <i>williamsiae</i>	E
Buckwheat, Clay-loving	<i>Eriogonum pelinophilum</i>	E
Cress, Toad-flax	<i>Glaucocarpum suffrutescens</i>	E
Gumplant, Ash Meadows	<i>Grindelia fraxinopratisensis</i>	TCH
Pennyroyal, McKittrick	<i>Hedeoma apiculatum</i>	T
Pennyroyal, Todsens's	<i>Hedeoma todsenii</i>	ECH
Ivesia, Ash Meadows	<i>Ivesia kingii</i> var. <i>eremica</i>	TCH
Wooly-threads, San Joaquin Valley	<i>Lembertia congdonii</i>	E



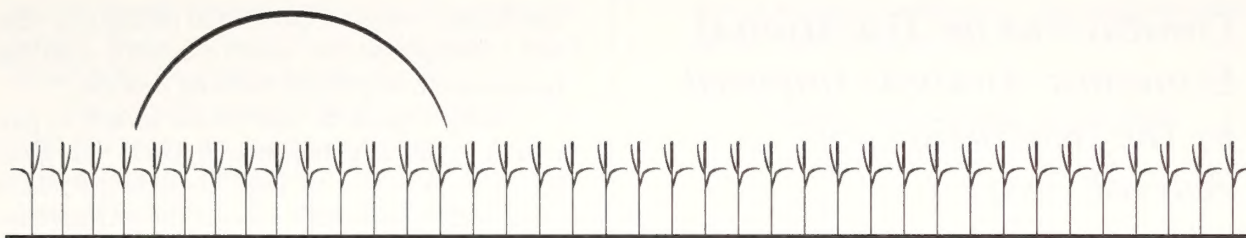
<b>Threatened and Endangered Species for All Analysis Units Combined</b>		
<b>Common Name</b>	<b>Scientific Name</b>	<b>Status</b>
Bladderpod, Dudley Bluffs	<i>Lesquerella congesta</i>	T
Lomatium, Bradshaw's	<i>Lomatium bradshawii</i>	E
Blazingstar, Ash Meadows	<i>Mentzelia leucophylla</i>	TCH
Four-o'clock, Macfarlane's	<i>Mirabilis macfarlanei</i>	E
Bakersfield Cactus	<i>Opuntia treleasei</i>	E
Grass, California Orcutt	<i>Orcuttia inaequalis</i>	E
Cactus, Brady Pincushion	<i>Pediocactus bradyi</i>	E
Cactus, San Rafael	<i>Pediocactus despainii</i>	E
Cactus, Knowlton	<i>Pediocactus knowltonii</i>	E
Cactus, Peebles Navaho	<i>Pediocactus peeblesianus</i> var. <i>peeblesianus</i>	E
Cactus, Siler Pincushion	<i>Pediocactus sileri</i>	E
Beardtongue, Penland	<i>Penstemon penlandii</i>	E
Lyon's Pentachaeta	<i>Pentachaeta lyonii</i>	PE
Phacelia, Clay	<i>Phacelia argillacea</i>	E
Phacelia, North Park	<i>Phacelia formosula</i>	E
Twinpod, Dudley Bluffs	<i>Physaria obcordata</i>	T
Orchid, Western Prairie Fringed	<i>Platanthera praeclara</i>	T
Primrose, Maguire	<i>Primula maguirei</i>	T
Pseudobahia, Tulare	<i>Pseudobahia peirsoni</i>	PE
Cliffrose, Arizona	<i>Purshia subintegra</i>	E
Buttercup, Sharp Autumn	<i>Ranunculus acriformis</i> var. <i>aestivalis</i>	PE
Reed-mustard, Barneby	<i>Schoenocrambe barnebyi</i>	E
Cactus, Unita Basin Hookless	<i>Sclerocactus glaucus</i>	T
Cactus, Mesa Verde	<i>Sclerocactus mesae - verdae</i>	T
Cactus, Wright Fishhook	<i>Sclerocactus wrightiae</i>	E
Groundsel, San Francisco Peaks	<i>Senecio franciscanus</i>	T
Checker-mallow, Nelson's	<i>Sidalcea nelsoniana</i>	T
Lady's-tresses, UTE	<i>Spiranthes divuialis</i>	T
Wirelettuce, Malheur	<i>Stephanomeria malheurensis</i>	E
Townsendia, Last Chance	<i>Townsendia aprica</i>	T

<sup>1</sup> Experimental nonessential in Gila River drainage of Arizona.









## APPENDIX G

# Economic Aspects of Supply and Demand for Livestock Forage on Public Lands

by

*William F. Hahn*

*Ken H. Mathews, Jr.*

*Ken E. Nelson*

*Livestock, Dairy, and Poultry Branch*

*Economic Research Service,*

*U.S. Department of Agriculture*

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### ***Introduction***

*The Forest Service and the Bureau of Land Management requested that ERS provide analysis of the economics of the supply and demand for forage in the form of a Technical Appendix to be used with the Draft Environmental Impact Statement. Requested information includes information on the theoretical issues surrounding the evaluation of grazing on federal lands administered by Forest Service (FS) and the Bureau of Land Management (BLM) and empirical analysis of economic issues relevant to grazing policy evaluation. The empirical issue addressed in this appendix concerns the differences between permittees and non-permittees. This is followed by a discussion of the effects of reductions in federal grazing availability and/or increases in Federal fees on individual livestock grazers and on U.S. livestock and meat production.*



## *Limitations on Traditional Economic Analysis Imposed by the Institutions of Federal Grazing*

Supply and demand analysis is technically valid only under competitive markets for homogeneous goods. The heterogeneity of Federal AUM's and the non-market supply side render traditional supply and demand analysis speculative in finding the value of federal AUMs. Also, the institutional features of the Federal grazing market make the market value of Federal forage unobserved. The market value has to be imputed. All methods of imputing market value have faults and are subject to inaccuracies and criticism. Further, there is no empirical data on which to base estimates of FS/BLM forage demand and supply elasticities. Even for indirect measures, such as permit value or subleases (Gee and Madsen), there are no regular, consistent, or comparable data gathered from which estimates of responses or elasticities can be reliably estimated.

Several institutional factors constrain the market for public grazing so that it is not competitive in the technical sense. Both the fee level and the maximum number of FS/BLM AUMs are directly under the control of the Government, not of competitive forage producers. The Federal forage supplier is not driven by the profit motive that underlies much of the economic theory of market supply. Both the Forest Service and BLM are willing to supply ranchers no more Animal Unit Months (AUMs) of grazing than the fixed allotment and only at the annually-determined fixed grazing fee. (An AUM is the BLM's billing unit for forage and is defined as one month's grazing for a cow and her unweaned calf, a yearling bovine, cow, bull, horse, or five sheep. BLM's billing AUM is equal to FS's billing unit, a head month.) With quantity and price fixed, there is little supply response that can be directly measured.

On the demand side, there appear to be enough ranchers to support competitive behavior. Even though allotments are fixed by FS/BLM, permittees may take as much or as little of their permitted grazing as they wish. However, the method in which grazing permits are

distributed, which requires that permittees control a nonfederal base ranch property, does not resemble a competitive bidding process.

Land, in general, and federal forage, in particular, is not a homogeneous good. The quality of each parcel of land, including FS/BLM land, is different and is seen in the different average appraised values for each of the six pricing areas delineated in the 1986 Grazing Fee Review and Evaluation Report and the 1992 update of that report. In the 1992 updated report, the regional average appraised values for forage ranged from \$4.68 to \$10.26 per head or per pair (a cow and her less-than-6-month-old calf) per month. For yearling cattle the range was \$4.68 to \$7.74 per head per month. For both categories of livestock, the highest average appraised value for forage was in pricing area 1, the Northern Plains, while the lowest was pricing region 5, basically the desert southwest. The appraised values on which these averages were based varied considerably within each region.

### *Special Considerations*

The market demand for all forage for beef cattle depends on cattle prices, which fluctuate with an approximate 10-year cycle, and the prices of other livestock species, forages, and feeds. In general, the value of a forage AUM to the producer fluctuates with cattle prices. The value of a specific forage AUM, like an AUM of FS/BLM forage, also fluctuates with the prices of alternative forage or feed sources.

The economic benefit of an AUM to a rancher depends on its productivity and on the cost and productivity of alternative feed sources. Being rational economic decision makers, ranchers will not lease an AUM if its economic benefit to them is less than its cost. If the economic benefit of an AUM exceeds (or, in theory equals) its cost, it will be leased.

The prices of alternative forage sources also depend upon their productivity and their ability to substitute for one another and for Federal forage. Substitution responses in using other forages have not been observed or measured.

In theory, the owner (potential supplier) of a unique natural resource will receive its full economic value from users (demanders) when the users of the resource bid competitively for it. Federal AUMs are unique resources, but they



are not leased competitively between potential buyers. Some, perhaps most, AUMs have a value to the permittee that exceeds the fee.

The primary determinant of rental rates for land and other natural resources is the price of their outputs. The value of having a license to graze that exceeds the grazing fee creates "permit value." Permittees capture some of the value of federal AUMs that could go to the Government. "Permit value" is an important piece of evidence that suggests most of the federal AUMs have values to permittees that exceed the grazing fee.

Grazing permits are assigned to a base ranch and the transfer of grazing permits with the sale of the base ranch appears to be fairly routine. If grazing permits' values to permittees exceed fees, then potential buyers of the ranch will recognize this value and be willing to pay more for a ranch with grazing permits than for the same ranch without grazing permits. In 1962, Gardner noted permit values could be relatively high. He quoted permit values for the late 1950's and early 1960's that were as high as "\$150 to \$200 per cow home year long or \$30 to \$50 per sheep home year long have been paid upon transfer of New Mexico Ranches." (sic) Recent research, such as that by Torell, Bartlett, and Obermiller in 1992, continues to support the notion of permit value.

The level of permit value might also give clues to the private value of federal AUM's. However, permits are a risky asset. The Government changes fees annually and periodically assesses the allowed levels of grazing, which makes the purchase of a base ranch speculative. Grazing permits are more speculative than most farm assets, and this affects their value. Permit values may be lower relative to their value in current use because the capitalized fee-value differences underlying permit values may be reduced by a risk premium.

## ***Potential Approaches to Fee Determination***

Despite the Federal forage "market" not being amenable to typical supply and demand analysis, a cost/benefit approach to FS/BLM grazing fee determination is still feasible. FS/BLM fees can be determined in several ways. Fees can be based on lease rates for comparable private lease rates or on the social costs of grazing.

Overall economic efficiency may suggest a ceiling for FS/BLM fee levels.

## **The Private Lease Approach to Benefits and Fees**

One method for calculating the private value for federal forage is based on the lease rates for similar private land. The argument for using private pasture lease rates is based on the idea that "pasture is just pasture." This stance assumes that federal land and private land are enough alike to be perfect substitutes. Both provide the same type of resource to ranchers—grazing land. Geographic and economic data implies that all grazing lands, including those in the federal grazing programs, are heterogeneous and therefore have different qualities and values.

Federal pasture and private pastures offer different combinations of resources. For example, in private leases, the owner may maintain the fences, while in public leases, the permittee may have to share fencing costs, mainly by providing labor for fence maintenance and construction. Also, there is evidence that cattle on isolated Forest Service lands can have lower conception rates and higher mortality. Also, because of the settlement patterns in the Old West, private lands are also likely to have better access to water.

Those who use private lease rates to calculate grazing values may adjust the private lease rates by subtracting "non-fee" costs of resource combinations represented in private lease rates. Even after these adjustments, estimated market values of federal AUMs are generally above federal grazing fees. The validity of this adjustment procedure requires the analytically difficult separation of productivity of the private leases' pasture and resource combinations. In addition, this method does not account for adjustments made in the use of other inputs into beef cattle production brought about by differences in marginal costs of FS/BLM versus private pasture.

## **The Social Cost Approach to Fees**

The relevant costs for consideration are those costs that would be saved if federal grazing pro-



grams were eliminated. One cost component is the costs of administering Federal grazing programs. These costs are discussed elsewhere. Average administrative costs for the 1993 programs were \$3.21/AUM for the BLM and \$3.24 for the Forest Service.

Federal costs also include the costs of environmental degradation and the loss of best use. A private land owner, when deciding upon a grazing program, is not only concerned with what his or her land can produce now, but also with what productivity will be in the future. Current grazing patterns can have important implications for future productivity. Likewise, costs of grazing on federal land must include the effects of current grazing practices on future productivity of the range in providing grazing and other private and public benefits.

Another factor that must be addressed in the cost analysis results from competing uses for public lands. The Forest Service and BLM are both mandated by law to manage their lands for multiple purposes and best use. These purposes include public concerns such as wildlife and environmental preservation and private activities such as livestock grazing, hunting, and recreation. To the extent that livestock grazing enhances or detracts from other management objectives, the costs of federal AUMs must be adjusted. If grazing detracts from other objectives, the costs of this detraction must be added to the costs of the grazing program. If Federal grazing enhances some of the objectives, then this benefit must be subtracted from program costs.

The administrative costs to the government, plus the net economic costs arising from the interaction of grazing on the other objectives underlying public land management, are the total social costs of public grazing. These total social costs are the relevant costs in the cost/benefit analysis of Federal grazing and may be difficult to measure.

### Efficiency Considerations

Most studies have concluded that the grazing fee for a federal AUM is historically lower than the private value of the AUM to the permittee, and lower than the price that would be charged in a competitive market. Because of the economic efficiencies of the competitive market, many are concerned that the low price

for Federal grazing leads to economic inefficiencies. Given the current institutional structure of Federal grazing, underpricing need not lead to efficiency losses.

Brokken and McCarl noted that overpricing could cause more inefficiency than underpricing. Brokken and McCarl stated that under the conditions they analyzed, economic efficiency would be maximized by setting fees to the Government's marginal costs of administration of federal lands. Brokken and McCarl's conditions for the efficiency of basing grazing fees on social costs are quite restrictive. These conditions include the requirement that current grazing patterns be environmentally sustainable. Also, while Brokken and McCarl recognize that private values for federal AUMs can vary westwide, they ignore the problems that can arise when the public costs of grazing vary Westwide as well. Just as federal lands vary in their productivity for grazing, their environmental sensitivity and the amount and quality of their other products varies as well. Grazing can have different environmental costs and differing effects on the production of other public and private goods depending on its locations.

Separately, one could argue that if the grazing fee works as a "lump sum" transfer payment from the government to permittees, the fee could be set below the government's marginal cost. These types of transfers do not distort production or consumption decisions and are economically efficient. However, this type of transfer can impose some second order losses on the economy as the government will be required to raise taxes to cover the losses in its grazing program, and increased taxes can cause decreases in economic activity. The grazing program is not rendered inefficient by below market value fees, but the national economy is more inefficient and less competitive worldwide because of the transfer payment from taxpayers to public land grazers.

### *Empirical Evaluation of Federal Grazing Reforms*

Numerous economic issues have been raised during the controversies surrounding possible changes in federal grazing fee regulations. These include questions about the costs and benefits of federal grazing to society as a whole and the



benefits and costs to individual permittees. While federal forage is harvested by beef cattle, sheep, goats, and horses, the focus of this section is on beef cattle production, although much of what is said also applies to the other livestock species grazing federal lands.

This section combines information from several sources, including the 1986 Grazing Fee Review and Evaluation Report, the 1992 update of that report, and data collected through a special cow/calf version of the 1990 Farm Costs and

Returns Survey (FCRS). The cow/calf version of the 1990 FCRS was a probability-based, stratified random sample of U.S. beef cow/calf operations in the 31 most important beef cow/calf states. This report uses a subset of U.S. beef cow/calf operations that was limited to beef cow/calf operations from 10 Western States (CA, CO, ID, MT, NM, ND, OR, SD, UT, and WY) in which both operators with FS/BLM grazing permits (permittees) and operators without FS/BLM permits (nonpermittees) were represented.

## Costs and Returns for Permittees and Non-permittees

### **1990 FCRS Numbers are Different from 1990 Numbers in the 1992 Grazing Fee Review and Evaluation Update of the 1986 Final Report**

There are two sources of estimates of 1990 costs and returns for permittees: the 1986 Grazing Fee Review and Evaluation and the just-available 1990 Farm Costs and Returns Survey (FCRS) reported in this appendix.

The ERS numbers in the 1992 Update and the 1986 Report also were from two sources. The permittee budgets used in the 1986 Grazing Fee Review and Evaluation and the 1992 Grazing Fee Review and Evaluation Update of the 1986 Final Report were based on permittee panels. There were 427 permittee cattle budgets and 73 permittee sheep budgets generated, which were aggregated into 13 state, 6 regional, and one 13-state budgets. The 13 individual state budgets and the 13-state budget for cattle and sheep were updated to 1990 using only price indexes for the 1992 Update. The implicit assumption was that technology remained unchanged from 1982 to 1990. Estimates of costs and returns for all western livestock producers, which represented nonpermittees in the 1986 Report and 1992 Update, were based on a 1976 Cost of Production survey. Both permittee and western livestock producer cost and return estimates were indexed to 1990 in the 1992 Update.

The Farm Costs and Returns Survey (FCRS), in which a special cow/calf version was done in 1990, was the basis for the new numbers for both permittee and nonpermittee beef cow/calf operations in this technical appendix and in those portions of the main EIS text. The FCRS data allowed a direct comparison between both permittees and nonpermittees from a common basis.

The 1990 FCRS data had not been analyzed for permittee information and was not available for the 1992 Update, and was not available until September of 1993. The 1990 cow/calf FCRS data shows that the industry has changed production technology a great deal since 1982.

While much of the previous work on grazing fees has been concerned with differences in costs between permittees and nonpermittees, the focus has been on additional costs permittees incur as they operate on FS/BLM land. Further, rarely were random samples of both permittee and nonpermittee subgroups of beef cow/calf producers examined from the same data base. This section compares the costs and re-

turns of the beef cow/calf enterprises for the two subgroups of producers. The cow/calf version of the 1990 Farm Costs and Returns Survey (FCRS) included both permittees and nonpermittees from several western and Plains states. The special cow/calf version of the FCRS was a probability-based, stratified random sample of U.S. beef cow/calf operations. (See box above.)





**Table 1:** Cow/calf production cash costs and returns per cow for the western region and for permittees and nonpermittees in 10 western and Great Plains states, 1990 (Source: Farm Costs and Returns Survey data)

Item	Non-permittees	Permittees	Non-permittees	Permittees
	Dollars per Ranch		Dollars per Cow	
Cash receipts	46,205	95,502	496	431
Cash expenses:				
Feeder cattle	4,446	1,152	48	5
Forest Service/Bureau of Land Management pasture	NA	2,768	NA	13
Other public pasture	521	2,625	6	3
Total other feed costs	16,635	27,050	179	122
Other variable cash expenses	8,338	21,920	90	102
Total variable cash expenses	29,921	53,515	321	245
Total fixed cash expenses	12,057	22,227	129	100
Total cash expenses	41,977	75,742	451	345
Cash receipts less cash expenses	4,228	19,760	45	86
Capital expenditures	11,462	18,446	123	83
Total, cash expenses and capital replacement	53,439	94,188	574	428
Net cash returns	-7,234	1,314	-78	3

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Two results stand out in the permittee-nonpermittee estimates from the FCRS data: both average per-cow costs and receipts for permittees are significantly lower than for nonpermittees (Table 1). Also, permittees are clearly larger livestock operators than nonpermittees. Permittees had over twice as many cows (221 cows versus 93 cows) and peak numbers of cattle (471 head versus 213 head) as did nonpermittees (Table 2). In addition, per-

mittees averaged almost nine times as many sheep as nonpermittees (112 sheep versus 13 sheep).

An estimate of the cost differential between permittees and nonpermittees from the special Cow/Calf version of the 1990 FCRS data suggest that nonpermittees costs were almost \$105 per cow higher than permittees (Table 1).<sup>1</sup> Estimated permittee receipts were \$65 lower than nonpermittee receipts (Table 1)<sup>2</sup>.

<sup>1</sup> Compare this 1990 FCRS-based \$105 cost to the permittee cost in figure 6.2 of the *Grazing Fee Review and Evaluation Update of the 1986 Final Report*, which was based on a different data set (see text box), and which shows permittees having a \$34 per cow cost advantage in 1990.





**Table 2:** Sample characteristics of 1990 FCRS cow/calf data (Source: Farm Costs and Returns Survey data)

Item	1990 FCRS		Fee Reports	
	Permit tees	Non-permit tees	Permittees	
	Ranches		1982	1990
Ranches represented	6,678	49,658		
<b>Cows</b>				
Average herd size	221	93		
Percent of cows on operations of:	<b>Percent</b>			
20-99 cows	8.1	25.6	14.5	11.6
100-499 cows	59.4	52.3	41.9	41.0
500 or more cows	32.5	22.0	44.9	47.4
Percent of operations with:				
20-99 cows	33.9	61.6	44.5	42.1
100-499 cows	56.9	35.1	46.5	45.3
500 or more cows	9.2	3.3	10.9	14.4

Permittees spent more per cow for breeding stock, fences, and hired labor than nonpermittees. Nonpermittees spent more per cow overall for capital items, primarily because of increased expenditures for machinery, buildings, equipment, feed, pasture rental, purchased stocker cattle, and most other variable and fixed cash costs.

Nonpermittees purchased over 10 times the feeder cattle. This greater involvement in purchased feeder cattle by nonpermittees would by itself increase per cow costs. However, on a per-cwt basis permittees costs were \$10 per cwt lower

than nonpermittees, and receipts per cwt were slightly higher for permittees.

Calf weights for permittees surveyed in the 1990 Cow/calf FCRS were higher than in 1982, a year of unusual price relationships<sup>3</sup>. Calf prices in 1982 were low relative to yearling prices. In some cases calf prices were only \$1-\$3 higher than yearling prices, while calf-yearling price differentials in 1990, at \$15-\$20 premiums for calves, were more typical. These higher calf weights combined with higher prices for calves, both in nominal terms and in relative terms, raised permittee revenues more than nonpermittees.

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<sup>2</sup> Nonpermittees show a loss for 1990, one of the beef cow/calf industry's best years. This result may be the result of the way receipts are estimated and fixed costs are allocated. Receipts are FCRS-reported cattle weights multiplied by state average prices (NASS) and do not reflect premiums or discounts individual operators may have encountered. The allocation procedure, which is based on relative values of production for all commodities produced on an operation, may have overestimated cow/calf shares of some items. However, the same methods were used for both permittees and nonpermittees, which means that the relationships between the two groups are reliable even if the absolute values of receipt and fixed cost estimates may not reflect actual levels.

<sup>3</sup> This may be understating calf weights if calves are being weaned at weights much greater than 500 pounds, which we suspect is the case. This would also lower yearling weights by including calves with yearlings.



## Effects of Size on Permittee and Nonpermittee Costs and Returns

Accounting for size of operation reduces some of the differences between permittees and nonpermittees both per cow and per cwt. Differences exist between size groups for both permittees and nonpermittees, with larger operations in both groups generally having lower costs per unit. Within each size group, permittees generally had both lower costs and receipts, but higher returns above all cash costs.

Regression analyses on both a per-cow and per-cwt basis yielded mixed results after taking cow herd size and purchased stockers into account (see Table 3). There were differences between the two groups for all cash costs per cow, net returns above all cash costs per cwt, and cash costs per cwt<sup>4</sup>. The dependent variables—all cash costs, net returns, and value of cattle and calves sold per cow—were a nonlinear function of size, measured by cow numbers, and number of purchased stockers. Only purchased stockers accounted for a higher value of cattle and calves sold on a per-cow basis.

**Table 3:** “t”- test results for mean cash costs, returns above cash costs, and receipts per cow and per cwt of cattle sold for small, medium, and large permittee and nonpermittees, 1990<sup>1</sup>

Null Hypothesis	Variable			
	Subgroup	Cash Costs	Net Returns	Receipts
	Alpha level at which difference is significant			
	Per Cow			
Nonpermittee -permittee = 0	Small	+ .01	- .01	n.s.
	Medium	+ .01	- .01	+ .01
	Large	+ .01	n.s.	+ .01
	Per Cut			
	Small	n.s.	- .01	+ .01
	Medium	+ .01	- .01	- .01
	Large	+ .01	n.s.	+ .01

<sup>1</sup> Small operations were those with less than 100 cows, medium operations were those with 100 to 499 cows, and large operations were those with 500 or more cows. Positive sign indicates second term mean was the smaller, negative sign indicates first term mean was the smaller; n.s. implies not significant at less than a 10 percent alpha level. The approximations to the t-statistics for comparing means with unequal variances and unequal sample sizes were calculated according to Steele and Torrie, 1980, p. 106.

**Source:** Cow/calf version, 1990 Farm Costs and Returns Survey.

<sup>4</sup> All cash costs, value of production, and net cash returns were regressed on a dummy variable for permittee-nonpermittee (0=nonpermittee, 1=permittee), either cow numbers and cow numbers squared or dummy variables for size of operation (size dummy variable 1 (less-than-100-cows)=1, otherwise =0; size dummy variable 2 (100-to-499-cows)=1, otherwise=0)) as measures of operation size, and varying combinations of purchased stocker numbers, purchased stocker numbers squared, and percent dependency. Regressions were estimated on both a per-cow and per-cwt basis, and cwt of cattle sold per cow was included as a regressor in the cash costs per cow regression. A significance level of 10 percent was the decision criteria for testing the null hypotheses of regressors having no effect on the dependent variables. R-square statistics ranged from .32 to .006.



The expected economic situation is that marginally there should be no differences between permittee and nonpermittee rates of return on investment, which ERS did not estimate. Taking size into account reduces the differences between permittees and nonpermittees in which permittees generally benefit from lower costs, but differences between the two groups are still present. The positive and significant coefficient for net returns above cash costs per cwt suggests that there is some advantage accruing to permittees. Further, the question of why permittees would be so much larger than nonpermittees remains.

### Measuring Individual Ranch Reaction to Reductions in FS/BLM AUM's

A permanent increase in fees or reductions in the availability of federal AUMs will result in a decline in the permit value attached to the permittees' base ranches. This decrease in the asset value of the ranch could prove very stressful for highly leveraged operations. Those without significant debt could better withstand increases in fees or reductions in federal AUMs.

As access to public grazing is reduced, permittees will reduce the size of their operations. Reduction in federal grazing will likely have the greatest impact on those ranchers most highly dependent upon federal forage. The reductions will vary with the financial condition of the ranch and the costs and availability of alternative grazing. Obviously, those permittees who are unprofitable would be further stressed by higher fees. Reducing their access to federal forage would also stress unprofitable permittees. The more profitable an operation, the better it will deal with higher fees or restricted use of federal lands.

The effect of higher fees or reduced federal grazing will also depend on the flexibility a ranch has in finding and purchasing alternative forage sources. Those ranches with the fewest alternatives and least flexibility will show the most extreme cutbacks in production in response to changes in federal grazing. Even ranches that are not greatly dependent on federal forage could be greatly stressed by reductions in its availability if they cannot find suitable and affordable alternative forage.

In their bulletin "Estimating Forage Values for Grazing National Forest Lands", Hahn *et al.* estimated the effect of the elimination of Forest Service grazing on representative permittees' ranches. Hahn *et al.* severely restricted the availability of alternative forage, but assumed that all forage sources were perfect substitutes with one another. The availability and seasonal use of all types of grazing was limited to that in the enterprise budgets. The only forage that was unlimited in its use and fully flexible across seasons was hay. Hay is generally too expensive to use except as a supplemental feed to carry animals over the winter months.

Hahn *et al.* found that eliminating Forest Service grazing tended to reduce the cow herd by only the ranch's dependency on Forest Service grazing. For example, a ranch that obtains 10 percent of its annual forage/feed needs from Forest Service land would tend to reduce its herd by 10 percent if its Forest Service permits were eliminated.

Most permittees may have more flexibility in their use of alternative grazing than Hahn *et al.* assumed. With this additional flexibility, permittees could probably reduce their cow herd by less than their dependency on federal lands. However, the assumption that federal grazing and all other forage sources are perfect substitutes is a rather strong assumption.

At the request of the Forest Service and BLM, we did further analysis of the effects of Federal forage reductions using a constant elasticity of substitution (CES) production function to model the tradeoffs between federal grazing and other forage sources. The CES production function can be written as:

$$Y^F = \sum_{i=1}^N \alpha_i X_i^\theta$$

where Y stands for the output,  $X_i$  is the amount used of input "i" (there are "N" such inputs) and "F", the alpha's, and theta are the function's parameters. The theta parameter determines the elasticity of substitution. The F parameter determines the returns to scale. When F is equal to theta, the production function produces constant returns to scale. The elasticity of substitution (denoted by a lower-case sigma) is:

$$\alpha = \frac{1}{\theta - 1}$$



The elasticity of substitution measures how well one input can substitute for another. As the elasticity of substitution grows more and more negative, inputs become better and better substitutes.

We constructed a modeling system that takes costs and returns data and an assumed elasticity of substitution and then builds a CES production function. We used this CES production function to analyze the effects of reductions in Federal grazing on a ranch. The model's parameters are based on the assumption that input use and output are both economically optimal (give the ranch the highest possible longrun profits) given input and output prices.

The model only works if the sample ranch is actually profitable. The assumption that the ranch is making as high a long-run profit as possible implies that the ranch would not be losing money in the long run because it is possible to break even by going out of business: no revenues, but no costs either. In any case, an enterprise that is losing money before a reduction in its federal AUMs or an increase in the grazing fees would be further stressed by more restrictions and/or higher costs. The model analyzes the effects of reductions on otherwise viable ranches.

In the CES model, the output of the ranch is the number of its cows and the price of this output is the dollar sales volume per head of cow. Profits are net cash returns before capital replacement. We grouped inputs into six classes. The first class is the federal AUMs. The second class is other leased pasture. The third input is the base ranch, itself. The base ranch input includes the rancher's land, buildings, and family labor. The fourth input is hay, the fifth all other cattle feeds, and the sixth is all other cash costs.

The total expenditures on other leased pasture, hay, other feeds, and all other cash cost items are given within the budgets. The total expenditure data can be used to create quantity and prices for these four inputs. Valuing federal AUMs and the yearly rental value of the base ranch are more difficult. The rental value of the ranch is not included within the budget and are imputed.

Also, as noted above, the institutional features of federal AUM leasing can lead to the value of the AUM to the rancher exceeding the cost of the grazing fee. The production function parameters for federal grazing should depend on its value to the rancher. This value can be higher

than the grazing fee. We had to impute a value to the grazing fee as well as impute value to the ranch.

Values for the ranch and for federal grazing that would lead to relatively large effects from reductions in federal grazing were selected. We set the value of federal grazing to the private lease rate. As noted above, people have argued that the difference in amenities between private and federal lands makes federal lands less valuable than private lands. By giving these two lands equal values, we maximize the implied productivity of federal land. The higher the productivity of federal land, the greater the impact reductions in federal allotments will have on the ranch's income and cattle herd.

All remaining profits were assigned to the value of the ranch. The ranch's returns before capital replacement were assumed to be just enough to maintain the ranch and the owner's family. The ranch was assumed to be breaking even on its full costs. Because of the structure of the CES function, the more profitable a ranch is, the less responsive it will be to cutbacks in the availability of federal grazing. By making the ranch a break-even proposition, the ranch operation was made sensitive to reductions in federal forage.

At the request of the Forest Service/BLM the ERS analyzed data for three classes of permittees. We selected the permittees from the FCRS cow/calf survey, and divided them into quintiles based on their dependency of federal forage. We used budgets for the first, (least dependent) third, and fifth dependency quintiles. The ranches in the third quintile were not profitable, so we adjusted their revenue per cow upward so that they would have the average net returns of permittees as a whole.

We fed data from budgets for permittees into the model, and then solved for the impacts of reductions in federal grazing by maximizing net cash returns before capital replacement subject to the constraints on the availability of federal grazing. We analyzed reductions in forage availability of 2, 10, 25, 50, 75, and 100 percent for four different elasticities of substitution, -100, -30, -4.4, and -1.01. For this analysis, we assumed that cattle prices and the prices of alternative forages were all constant. It is likely that reductions in federal grazing might lead to some minor increases in both cattle prices and the prices of nonfederal forage inputs. These small changes will roughly cancel one another out. The 1990



Federal grazing fee of \$1.81 per AUM was used in the analysis because the beginning costs and gross and net returns were estimated from the cow/calf version of the 1990 FCRS.

Effects of reductions in federal AUMs from the CES model for the most dependent quintile of permittees

The results of our analysis are summarized in Tables 4, 5, and 6. Note that the elasticity of substitution only has a large impact on the results for major reductions in the availability of federal grazing. When the elasticity of substitution is close to -1, eliminating any one input

will lead to the elimination of the enterprise. This result is peculiar to the specific production function chosen for the analysis and does not imply that the ranch would go out of business. When elasticities of substitutions were set at -1.01, all three of the ranches disappeared when their federal grazing was eliminated. Extrapolation of other numbers in the tables is likely to produce more consistent results for the three cases of 100 percent reductions in federal grazing and substitution elasticities of -1.01.

In all cases, smaller reductions in federal grazing had roughly the same effects on the

**Table 4:** Effects of reductions in federal AUMs from the CES model for the least dependent set of permittees

Sample Ranch Data—Low dependency				
Ranch quintile	0-20%			
Cow herd	308 cows			
Dependency	10.9%			
Revenue per cow	\$497.77			
Cash costs per cow	\$352.65			
Returns per cow	\$145.12			
Total ranch returns	\$44,697			
Reduction in federal forage	Elasticity of substitution			
	-100	-30	-4	-1.01
Cow herd after reductions				
2%	307	307	307	307
10%	304	304	304	304
25%	299	299	299	298
50%	290	290	289	284
75%	281	281	278	262
100%	272	271	263	<sup>1</sup>
Total ranch returns after reductions				
2%	\$44,608	\$44,608	\$44,608	\$44,608
10%	\$44,250	\$44,250	\$44,250	\$44,205
25%	\$43,624	\$43,580	\$43,580	\$43,401
50%	\$42,507	\$42,507	\$42,328	\$41,613
75%	\$41,389	\$41,345	\$40,942	\$38,618
100%	\$40,272	\$40,138	\$38,886	<sup>1</sup>

<sup>1</sup> The production function asserted in this analysis yields zero production when the elasticity of substitution approaches -1 and any input level is zero, like federal forage at 100% reduction.





**Table 5: Effects of reductions in federal AUMs from the CES model for the third quintile of permittees**

<b>Sample Ranch Data—Medium dependency</b>				
Ranch quintile	40-60%			
Cow herd	217 cows			
Dependency	43.8%			
Revenue per cow	\$434.00			
Cash costs per cow	\$381.19			
Returns per cow	\$52.81			
Total ranch returns	\$11,460			
Reduction in federal forage	Elasticity of substitution			
	-100	-30	-4	-1.01
Cow herd after reductions				
2%	214	214	214	214
10%	202	202	202	202
25%	180	180	180	179
50%	143	143	142	136
75%	107	106	101	85
100%	69	67	50	<sup>1</sup>
Total ranch returns after reductions				
2%	\$11,322	\$11,322	\$11,322	\$11,322
10%	\$10,784	\$10,784	\$10,784	\$10,761
25%	\$9,775	\$9,764	\$9,741	\$9,661
50%	\$8,079	\$8,068	\$7,965	\$7,563
75%	\$6,383	\$6,349	\$6,028	\$4,939
100%	\$4,653	\$4,527	\$3,381	<sup>1</sup>
<sup>1</sup> The production function asserted in this analysis yields zero production when the elasticity of substitution approaches -1 and any input level is zero, like federal forage at 100% reduction.				

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**Table 6:** Effects of reductions in federal AUMs from the CES model for the most dependent quintile of permittees

<b>Sample Ranch Data—Low dependency</b>				
Ranch quintile	80-100%			
Cow Herd	93 cows			
Dependency	85.0%			
Revenue per cow	\$405.43			
Cash costs per cow	\$315.41			
Returns per cow	\$90.02			
Total ranch returns	\$8,372			
Reduction in Federal forage	Elasticity of Substitution			
	-100	-30	-4	-1.01
Cow herd after reductions				
2%	92	92	92	92
10%	89	89	89	89
25%	82	82	82	81
50%	71	71	70	67
75%	60	60	58	49
100%	49	48	41	<sup>1</sup>
Total ranch returns after reductions				
2%	\$8,297	\$8,297	\$8,297	\$8,297
10%	\$8,012	\$8,012	\$8,003	\$7,995
25%	\$7,459	\$7,459	\$7,443	\$7,384
50%	\$6,547	\$8,068	\$6,463	\$6,170
75%	\$5,634	\$6,538	\$5,400	\$4,529
100%	\$4,705	\$4,630	\$3,926	<sup>1</sup>
<sup>1</sup> The production function asserted in this analysis yields zero production when the elasticity of substitution approaches -1 and any input level is zero, like federal forage at 100% reduction.				



ranch no matter what the elasticity of substitution. Consequently, we can be more confident about our predictions of the effects of relatively small reductions in federal grazing on a profitable ranching enterprise.

Also at the request of the Forest Service/BLM, we prepared a more detailed analysis of the effects of reductions in Federal grazing on the FCRS average permittee with a medium elasticity of substitution of -30. These results are found in Table 7, below.

**Table 7:** Effect on herd, costs, and returns for FCRS average permittee of reductions in the allotted level of federal AUMs

Percent cut in federal forage	# of cows	Ranch revenue	Cash costs before capital replacement	Net cash returns before capital replacement	Federal permits, in AUMs	Federal permits costs	Privately leased forage	Hay	Other feeds	Other variable cash costs
None	221	\$95,502	\$75,742	\$19,760	1,529	\$2,768	\$7,745	\$14,247	\$5,683	\$45,299
1	220	\$95,026	\$75,295	\$19,731	1,514	\$2,741	\$7,700	\$14,164	\$5,651	\$44,039
2	219	\$94,454	\$74,850	\$19,604	1,499	\$2,713	\$7,656	\$14,082	\$5,617	\$44,782
3	217	\$93,883	\$74,404	\$19,479	1,484	\$2,685	\$7,610	\$14,001	\$5,585	\$44,523
4	216	\$93,311	\$73,957	\$19,354	1,468	\$2,658	\$7,565	\$13,918	\$5,552	\$44,264
5	215	\$92,385	\$73,512	\$19,323	1,453	\$2,630	\$7,521	\$13,836	\$5,519	\$44,006
6	213	\$92,263	\$73,064	\$19,199	1,438	\$2,602	\$7,476	\$13,753	\$5,486	\$43,747
7	212	\$91,692	\$72,620	\$19,072	1,422	\$2,575	\$7,431	\$13,671	\$5,454	\$43,489
8	211	\$91,216	\$72,175	\$19,041	1,407	\$2,547	\$7,387	\$13,590	\$5,420	\$43,231
9	210	\$90,549	\$71,728	\$18,821	1,392	\$2,519	\$7,342	\$13,507	\$5,388	\$42,972
10	208	\$89,977	\$71,282	\$18,695	1,377	\$2,492	\$7,297	\$13,425	\$5,355	\$42,713
11	207	\$89,406	\$70,837	\$18,570	1,361	\$2,464	\$7,253	\$13,342	\$5,322	\$42,455
12	206	\$88,930	\$70,389	\$18,541	1,346	\$2,436	\$7,208	\$13,260	\$5,289	\$42,196
13	204	\$88,358	\$69,944	\$18,414	1,331	\$2,408	\$7,163	\$13,178	\$5,257	\$41,938
14	203	\$87,787	\$69,497	\$18,290	1,315	\$2,381	\$7,119	\$13,096	\$5,223	\$41,678
15	202	\$87,310	\$69,051	\$18,259	1,300	\$2,353	\$7,074	\$13,013	\$5,191	\$41,420
25	189	\$81,786	\$64,581	\$17,205	1,147	\$2,076	\$6,626	\$12,189	\$4,862	\$38,828
50	157	\$67,879	\$53,365	\$14,514	765	\$1,384	\$5,502	\$10,120	\$4,037	\$32,322
75	125	\$53,973	\$42,034	\$11,939	382	\$692	\$4,364	\$8,028	\$3,203	\$25,747
100	91	\$39,399	\$30,297	\$9,102	0	0	\$3,184	\$5,857	\$2,337	\$18,919





**Table 7 (continued):** Effect on herd, costs, and returns for FCRS average permittee of reductions in the allotted level of federal AUMs

Percent cut in federal forage	# of cows	Ranch revenue	Cash costs before capital replacement	Net cash returns before capital replacement	Federal permits, in AUM	Federal permits costs	Privately leased forage	Hay	Other feeds	Other variable cash costs
Change in item (relative to base) divided by change in allowed AUMs										
1	0.07	\$31.14	\$29.23	\$1.91	1	\$1.77	\$2.94	\$5.43	\$2.09	\$17.00
2	0.08	\$34.25	\$29.16	\$5.09	1	\$1.80	\$2.91	\$5.39	\$2.16	\$16.90
3	0.08	\$35.29	\$29.16	\$6.13	1	\$1.81	\$2.94	\$5.36	\$2.14	\$16.91
4	0.08	\$35.81	\$29.18	\$6.63	1	\$1.80	\$2.94	\$5.38	\$2.14	\$16.92
5	0.08	\$34.87	\$29.16	\$5.71	1	\$1.80	\$2.93	\$5.37	\$2.14	\$16.91
6	0.08	\$35.29	\$29.18	\$6.11	1	\$1.81	\$2.93	\$5.38	\$2.15	\$16.91
7	0.08	\$35.59	\$29.16	\$6.43	1	\$1.80	\$2.93	\$5.38	\$2.14	\$16.91
8	0.08	\$35.03	\$29.15	\$5.88	1	\$1.81	\$2.93	\$5.37	\$2.15	\$16.90
9	0.08	\$35.98	\$29.16	\$6.82	1	\$1.81	\$2.93	\$5.38	\$2.14	\$16.90
10	0.08	\$36.12	\$29.16	\$6.96	1	\$1.80	\$2.93	\$5.37	\$2.14	\$16.91
11	0.08	\$36.23	\$29.16	\$7.07	1	\$1.81	\$2.92	\$5.38	\$2.15	\$16.90
12	0.08	\$35.81	\$29.17	\$6.64	1	\$1.81	\$2.93	\$5.38	\$2.15	\$16.91
13	0.08	\$35.93	\$29.16	\$6.77	1	\$1.81	\$2.93	\$5.38	\$2.14	\$16.90
14	0.08	\$36.03	\$29.16	\$6.87	1	\$1.81	\$2.92	\$5.38	\$2.15	\$16.91
15	0.08	\$35.71	\$29.16	\$6.54	1	\$1.81	\$2.92	\$5.38	\$2.14	\$16.91
25	0.08	\$35.87	\$29.19	\$6.68	1	\$1.81	\$2.93	\$5.38	\$2.15	\$16.92
50	0.08	\$36.12	\$29.26	\$6.86	1	\$1.81	\$2.93	\$5.40	\$2.15	\$16.97
75	0.08	\$36.20	\$29.38	\$6.82	1	\$1.81	\$2.95	\$5.42	\$2.16	\$17.04
100	0.09	\$36.68	\$29.71	\$6.97	1	\$1.81	\$2.98	\$5.49	\$2.19	\$17.25



## Federal and Other Forage Availability in the U.S.

Cattle inventory numbers have increased after 1990 but are still far below peak numbers of the mid 1970s. Estimates of pasture and total roughage use have correspondingly declined during recent years while concentrate used by feed cattle, hogs, and poultry have increased.

### Forage Consuming Livestock

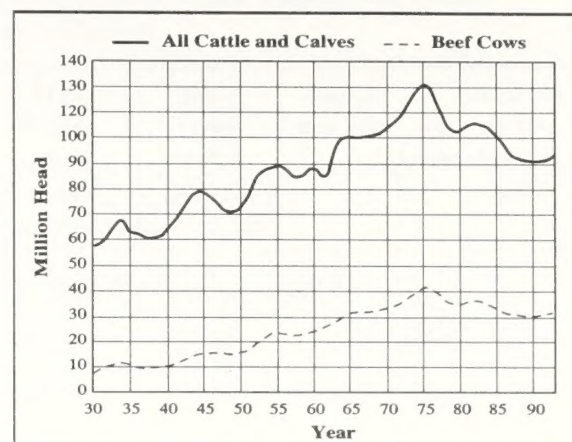
Beef cattle raising (cow/calf and stocker) operations are the primary users of grazing land in the U.S.—cattle feedlots use primarily concentrate feeds. Dairy cattle, sheep, goats, horses, some hogs, and other stock together use a small proportion of grazing land.

Cattle raising operations are widely dispersed throughout the U.S. utilizing whatever grazing is available at low cost. Feedlots (especially the larger ones) are concentrated in a triangle bounded by Texas, Colorado, and Illinois where weather, grain prices, and feeder supplies have been attractive. It is possible to raise cattle on grain in a “dry lot” operation but typically, grain and even hay use is limited to supplemental or emergency feed in cattle raising because the input costs are too high to use grain as the primary feed and still be profitable

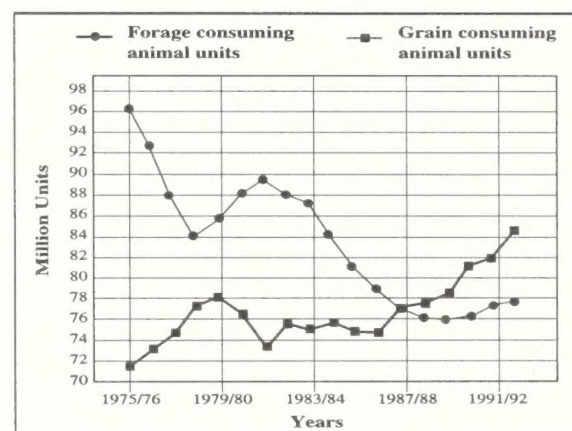
Only a small proportion of the feed fed to U.S. cattle comes from federal lands (an estimated 2 percent nationally (Joyce)), so changes in federal grazing policy will have only small effects on U.S. beef and beef cattle prices and beef production. Higher grazing fees would increase producer costs, which could result in fewer cattle being supplied. In the long run, higher fees or restrictions on grazing would cause a slight contraction or relocation in beef and cattle supply and some small increase in prices. In the short run, the effects of proposed changes in federal grazing fees would be overshadowed by cyclical changes in cattle numbers (Figure 1).

Recent trends in the numbers of cattle and other grazing animals suggest that the United States has sufficient forage in private hands to offset reductions in federal forage use or avail-

**Figure 1:** Fluctuations in cattle numbers marked by cycles.



**Figure 2:** Trends in animal production.



ability. Figure 2 illustrates these trends in feed consumption. Since the 1970s there has been a relative increase in the importance of grain feeding to support U.S. animal production. The number of animals in pastures is currently about 15 percent below the numbers in the late 1970s. The United States has been able to support many more animals in its pastures and ranges than it supports now. The 15 percent drop in animals implies a 15 percent drop in the demand for pastures. During this time, there has been relatively little change in the use of federal grazing.

### Pasture and Range Resources

Grazing lands are residual to crop production and other uses. Pasture and range acreages have been converted to cropland when demand

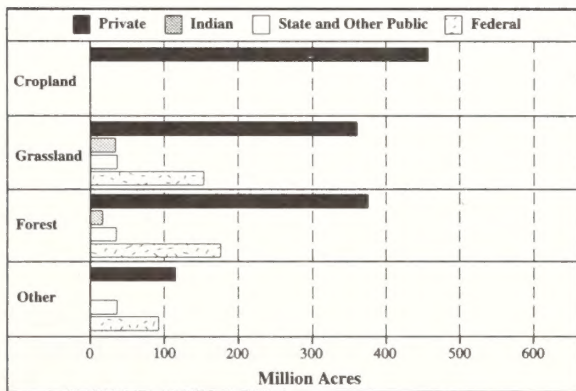


for crop products was high relative to livestock or vice versa as livestock inventories fluctuate, and substantial acreages of land previously used for grazing have been shifted to recreational, wildlife, urbanization, idle, and environmental purposes. Under favorable growing conditions, particularly in the southern regions, pasture land reverts to forest. These forces have combined to cause a long-term net decline in pasture and range acreage, from just over 1 billion acres in 1949 to 811 million in 1987.<sup>5</sup>

All pasture and range accounted for about 811 million acres in 1987, 36 percent of the land area of the country. Included are three major types: cropland pasture, other grassland pasture and range, and forestland on which grazing occurs as a multiple use. Excluded from the total is land grazed before or after crops were harvested. Also excluded were about 60 million acres in Federal Grazing Districts and range allotments that have little value for grazing but which are intermingled and managed with productive federal range.

Cropland pasture is the smallest but most productive component of grazing acreage and totals about 65 million acres. Cropland pasture is virtually all privately owned (Figure 3), is generally the most valuable land, and can be shifted

**Figure 3:** Public ownership is important in grazing land.

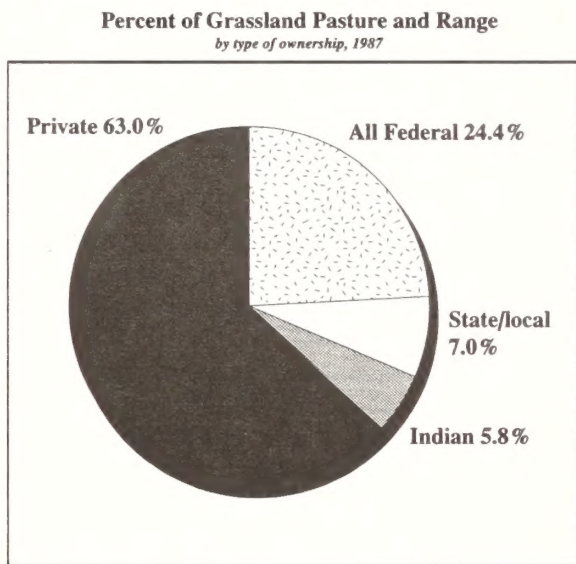


relatively easily between pasture and other crops depending on relative profitability. Another source of (high priced) forage comes from about 60 to 65 million acres of hay harvested each year from land classified as cropland. By 1993, 36 million acres of cropland was diverted into the long-term Conservation Reserve Program (CRP).

In 1996, CRP contracts begin to expire and some of this land could be used for pasture.

Grassland pasture and (nonforested) range is the dominant use of land in the Mountain region and Southern Plains and the dominant agricultural use in the Northern Plains and Pacific regions. Of the approximately 590 million acres, 144 million were owned by the Federal Government, and another 74 million were under public ownership of other types in 1987 (Figure 4). Pasture land is relatively low valued and holds the traditional role of grazing for marginal land. Forage productivity varies tremendously

**Figure 4:** Federal acreage is large...



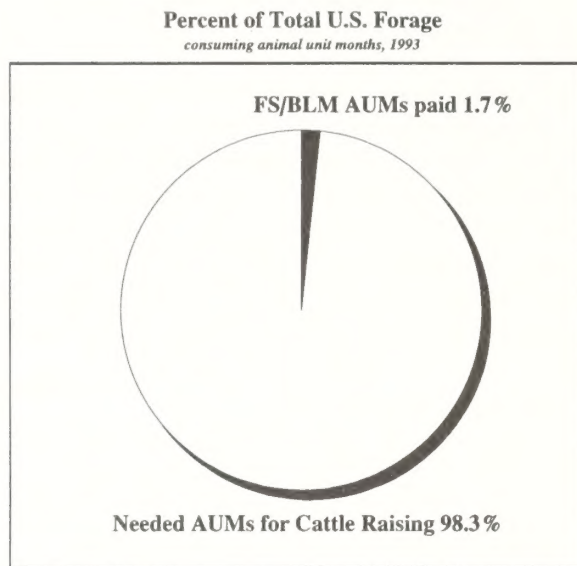
from region to region and parcel to parcel. Almost half of all grazing land acres are publicly owned. federal land is concentrated in the western part of the country. However, these publicly owned acres are relatively unproductive grazing land and comprise only two percent of forage consumed (Figures 5 and 6).

About 155 million acres of the 731 million acres of U.S forest land were considered grazed in 1987. A total of 174 million acres of forest are federally owned but the proportion of grazed forest federally owned is uncertain. Grazing productivity varies greatly with terrain, tree density, and species. While acreage data is most readily available, acreage is not a reliable measure of the amount of feed provided by grazing land or the proportion of livestock dependent

<sup>5</sup> This section uses text and data from (Daugherty, 1991), (Daugherty, 1989), and (Jones and Hexem, 1990).



**Figure 5:** ...but supplies a small share of the national forage needs.



upon it because the amount of forage produced from an acre varies so greatly. Data from 1982 is illustrative as to the huge difference in grazing land per animal unit of cattle and sheep. Corn Belt states range from 1.2 to 3.5 acres per animal unit. Mountain states ranged from 17 acres per animal unit in Montana to more than 80 acres per animal unit in New Mexico and Arizona. The U.S. average was 8.9 acres per animal unit.

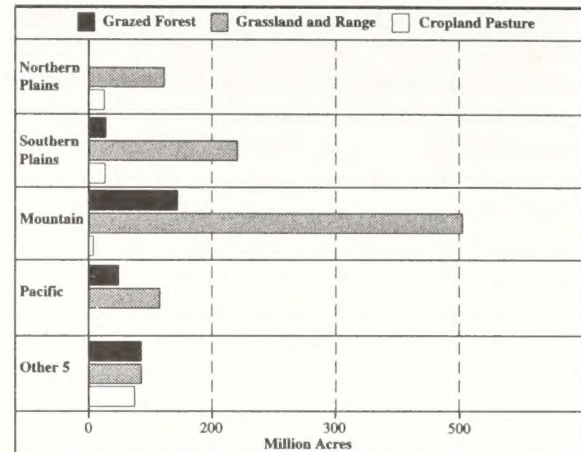
Federal lands are usually considered to be of lower quality or value for forage than private lands, because it is presumed the more desirable lands were claimed and converted to private ownership. Access to water is particularly important to livestock producers.

Grazing fee reforms are likely to have little effect on the aggregate U.S. livestock industry. However, the distribution of the effects is not going to be uniform throughout the industry. While most producers will feel no effects from changes in federal grazing fees or availability, highly dependent producers will be faced with making major adjustments.

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**Figure 6:** Grazing land is concentrated in the West.



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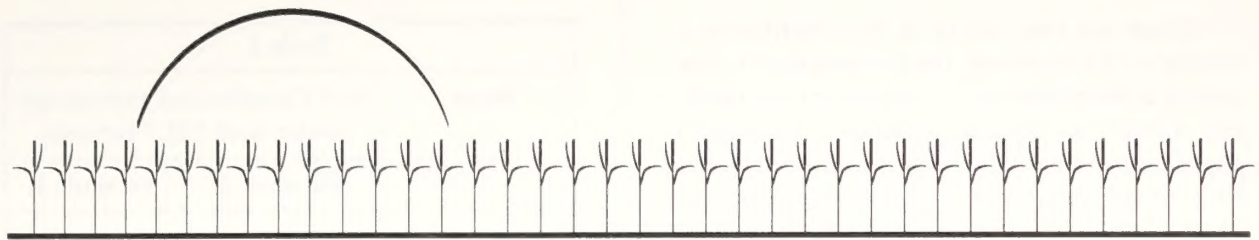
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# APPENDIX H

## Payments-in-Lieu-of-Taxes (PILT)

*Under the Payments-in-lieu-of-taxes Act passed in 1976 (the PILT Act), Congress makes payments to local units of government (usually counties) where certain federal lands are located, including most BLM-administered lands, most National Forest System lands, and National Grasslands. These payments are intended to provide counties that contain federal lands with revenue to compensate for the lack of local property tax revenue. The PILT payments are meant to supplement other federal revenue sharing payments – such as grazing fee receipts – that local governments receive. Table 1 below shows PILT payments to the 17 western states for fiscal year 1992.*

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Table 1: Payments-In-Lieu-of-Taxes to 17 Western States, Fiscal Year 1992

State	Amount	State	Amount
Arizona	\$ 8,399,837	North Dakota	556,525
California	8,400,075	Oklahoma	780,930
Colorado	6,411,140	Oregon	2,870,589
Idaho	7,245,410	South Dakota	1,299,931
Kansas	338,045	Texas	1,287,785
Montana	7,696,992	Utah	8,860,045
Nebraska	334,149	Washington	1,355,951
Nevada	6,445,872	Wyoming	7,158,864
New Mexico	10,491,751	TOTAL	\$79,933,891

Source: USDI, 1992



There are two methods for calculating a county's PILT payment; the amount paid to the county is the higher calculated under both methods, subject to payment ceilings. A county's population, amount of federal entitlement acres, and certain payments made to the state and county by the Federal Government, are the variables that determine which method would yield the higher payment to the county. Depending on which formula a county's PILT payment falls under, increases in grazing fee receipts could cause a corresponding decrease in PILT (the reverse is also true).

Under Formula "A," grazing fee receipts returned to states and counties during the year are deducted from the county's PILT payment the following year; thus, counties whose grazing fee receipts are increasing would experience a corresponding decline in PILT payments. Similarly, counties whose grazing fee receipts are decreasing would experience a corresponding increase in PILT payments. Formula "A" is as follows:

FORMULA A:

$$\begin{array}{r} (\text{\# of Entitlement Acres}) \times \$0.75/\text{acre} \\ - \text{Prior Year's Payments} \\ = \text{PILT payment} \end{array}$$

PILT payments are subject to payment ceilings based on a county's population. If a county's payment calculation under Formula "A" exceeds this ceiling, then the prior year's payments are deducted from the ceiling amount.

An exception to the provision of deducting grazing fee receipts returned to states from PILT payments is allowed under the regulations (43 CFR 1181). If states pass these grazing fee receipts through directly to school districts or other special or single purpose districts, then the receipts are not deducted from the PILT payment. For example, in 9 western states, grazing fee receipts collected under the Taylor Grazing Act are not deducted from those states' PILT payments (Arizona, Colorado, Idaho, Nebraska, Nevada, North and South Dakota, Utah, and Wyoming). But, grazing fee receipts collected on Forest Service administered rangelands are deducted from PILT payments.

Currently, about 76 percent of the counties in the 17 western states receive PILT payments under Formula "A" (see Table 2).

State	# of Counties and Percentage under each PILT formula	
	Formula A	Formula B
Arizona	13 ( 87%)	2 ( 13%)
California	27 ( 47%)	31 ( 53%)
Colorado	31 ( 54%)	26 ( 46%)
Idaho	30 ( 68%)	14 ( 32%)
Kansas	41 ( 93%)	3 ( 7%)
Montana	46 ( 82%)	10 ( 18%)
Nebraska	45 (100%)	0 ( 0%)
Nevada	10 ( 59%)	7 ( 41%)
New Mexico	31 ( 97%)	1 ( 3%)
North Dakota	44 ( 92%)	4 ( 8%)
Oklahoma	57 ( 93%)	4 ( 7%)
Oregon	3 ( 9%)	32 ( 91%)
South Dakota	40 ( 95%)	2 ( 5%)
Texas	82 ( 89%)	10 ( 11%)
Utah	26 ( 90%)	3 ( 10%)
Washington	13 ( 34%)	25 ( 66%)
Wyoming	20 ( 87%)	3 ( 13%)
<b>Total Counties</b>	<b>559 ( 76%)</b>	<b>177 ( 24%)</b>

Source: USDI, 1992.

Under Formula "B," grazing fee receipts are not deducted; thus, a change in grazing fee receipts would not affect a county's PILT payment. Formula "B" is as follows:

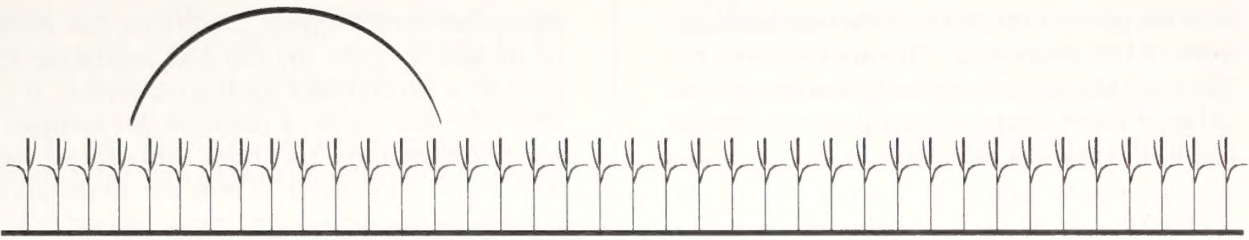
FORMULA B:

$$\text{PILT payment} = \text{\# of Entitlement Acres} \times \$0.10/\text{acre}$$

Formula "B" is also subject to a payment ceiling based on the county's population. If a county's payment calculation under formula "B" exceeds this ceiling, then the county is paid the amount calculated to be the ceiling.

About 24 percent of the counties in the 17 western states receive PILT payments under Formula "B" (see Table 2).





# APPENDIX I

## Biological Methodology

### *Ecological Status*

*The BLM has ecological status information on approximately 81.8 million acres as of the end of Fiscal Year 1992. This information is based on inventories that have been completed over the last 10 to 15 years. The bulk of the inventories were completed in the late 1970s and early 1980s. Inventory work is presently ongoing with 1 to 2 million acres being inventoried each year.*

*An additional 45.4 million acres have a variety of other inventories that primarily assess range condition, and 31.2 million acres are assessed via professional judgement. These inventories and professional judgements are more an assessment of livestock forage value than true ecological status.*

*Ecological status is not determined for approximately 6.8 million acres of nonnative seedings and annual rangelands administered by the BLM. The range condition assessment for these areas has been primarily based on a livestock forage resource value rating.*

*For the purpose of this EIS analysis, we assume the percentage of land in the various ecological seral stages on the 81.8 million acres of inventoried land also represents the BLM-administered land that does not have an ecological site inventory. The existing situation is portrayed as being the ecological status data, seral stage percentages, compiled in the BLM's Annual Rangeland Report for Fiscal Year 1992. The seral stage percentages projected for each alternative are based on the professional judgement of the interdisciplinary teams of resource specialists who*



were the primary preparers of the vegetation sections of this document. This analysis does not "project" any new ecological status inventories; rather, it shows the relationship of each alternative to the existing data set.

## Trend

The BLM has rangeland trend information on approximately 140.9 million acres as of the end of Fiscal Year 1992. An additional 24.2 million acres is recognized as being undetermined with respect to trend. This information is either "apparent" trend (67 percent), or "monitored" trend (33 percent). The distinction is that apparent trend results from a one-time measure of rangeland characteristics. It only provides a picture of the situation at the time of measurement. The monitored trend is the result of evaluating rangeland site characteristics over a longer period of time to see whether an area is improving, deteriorating, or static.

For the purpose of this EIS analysis, the existing situation is portrayed as being the rangeland trend data compiled in the BLM's Annual Rangeland Report for Fiscal Year 1992. The trend percentages projected for each alternative are based on the professional judgement of the interdisciplinary teams of resource specialists who were the primary preparers of the vegetation sections of this document.

## Upland Functioning Condition

For the purposes of analysis within this document, proper functioning of upland areas

represents the minimum conditions that must be present to allow the soil and vegetation to produce a natural biological community. It is used here as a frame of reference for comparison of alternatives. The intent is to provide the reader with an estimate of how the adoption of the various alternatives may impact upland functioning condition as defined for this analysis.

The baseline or existing situation of functional condition status is not to be considered as a hard data estimate individually but only as a starting point by which the relative difference between alternatives.

The estimates of the rate of change of upland functioning condition by alternative were developed through the professional judgement of resource specialists in consideration of the intent of each alternative in relation to the potential of upland habitats to change as a result of each alternative.

The rate of change is expressed as a percent of each condition class that would be expected to either increase or decrease as a result of the alternative. For example, the estimated starting point 20.5 million acres of uplands in non-functioning condition is expected to decrease by 60%, functioning at risk acres would decrease by 100%, and proper functioning condition acres would increase by 65% under the no grazing alternative in the long term. See Table 1.

## Riparian Functioning Condition

The terms Proper Functioning Condition, Functional at Risk, Nonfunctional, and Unknown are defined in the BLM Technical Refer-

**Table 1:** Estimated % Rate of Change of Functioning Condition

Upland Functioning Condition	Baseline	CM		NG		LP		EE		PA	
		ST	LT	ST	LT	ST	LT	ST	LT	ST	LT
PFC	90,500,000	0	+30%	+5%	+65%	+T	+40%	+5%	+65%	+T	+55%
FAR	48,000,000	0	-55%	-5%	-100%	-T	-75%	-5%	-100%	-T	-90%
NF	20,500,000	0	-T	-T	-60%	-T	-15%	-T	-60%	-5%	-30%

**Note:** CM - Current Management Alternative, NG - No Grazing Alternative, LP - Livestock Production Alternative, EE - Environmental Enhancement Alternative, PA - Proposed Action, PFC - Proper Functioning Condition, FAR - Functioning at Risk, NF - Nonfunctioning Condition, and T - Trace or minimal amount of change.



ence 1737-9 publication Riparian Area Management. This document outlines a process for assessing proper functioning condition. The BLM acreage in the respective functioning condition classes was based on field office responses to a BLM Instruction Memorandum issued in August 1993.

The determination of the anticipated response of riparian resources to the various management alternatives were initially determined and agreed to by consensus of a group of eleven fishery and wildlife biologists from throughout the Western states. It was unanimously agreed upon that the response of the riparian vegetation to the management proposed under each alternative would be the key factor in determining impacts on the wildlife resources. The determination of the ranges in percent change in riparian resource functioning conditions was the result of extensive discussions of the potential of riparian resources throughout the West. Their recommendations/determinations were accepted by the larger group of specialists writing the EIS.

Table 2 reflects the estimated average percent changes used for each alternative for the short- and long-term analysis:

<b>Alternative</b>	<b>Time Frame</b>	<b>Average Change</b>
Current Mgt	Short-term	0%
	Long-term	-3%
Proposed Act	Short-term	2%
	Long-term	20%
Livestock Prod	Short-term	-3%
	Long-term	-8%
Environmental	Short-term	13%
	Long-term	53%
No Graze	Short-term	20%
	Long-term	68%

## **AUMs**

The AUM data for analysis was taken from the BLM's Public Land Statistics, 1991, and the FS Grazing Statistical Summary FY 1992. This data is the most current data available and represents actual AUMs sold by the agencies.

The comparisons of AUMs are estimates of the difference in AUMs by alternative and projected directly from the actual AUMs per the referenced material. The difference in the projections are primarily the established long-term trends of the statistical reports, ecological conditions, functioning conditions, objectives status for the FS, and acres available for grazing.

Refer to assumptions and analysis guidelines in Chapter Four for more detailed descriptions of alternative specific analysis guidelines.

## **Forest Service Rangeland Status and Trend**

The Forest Service establishes land management objectives, including rangeland resource objectives, in individual national forest land and resource management plans. In 1992 the Forest Service implemented its new program for evaluating how rangeland activities progress toward better condition of rangeland ecosystems. The following categories were established: acres meeting forest plan objectives; acres moving toward forest plan objectives; acres not meeting or moving toward forest plan objectives; and acres of undetermined status (unknown). National Forest System lands with range vegetation management objectives were classified into one of these categories for the first time in 1992.

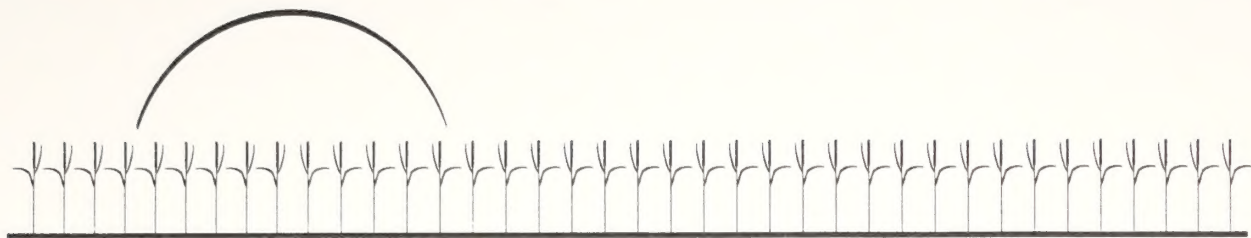
Professional resource managers classified lands with range vegetation management objectives into the categories above using existing inventories, monitoring data, and professional judgement. The reliability of these estimates varies with the amount of data available and personal knowledge of the areas.

For the purposes of analyzing the environmental consequences in this analysis, the acres of undetermined status were prorated into the other categories based on the ratio acres in the other categories.









# APPENDIX J

## 3-Year Average AUMs Authorized (BLM) and Actual Use (Forest Service)

*These numbers were used to assess economic impacts from changes in grazing fees and changes in AUM's. The average level of authorized and paid use listed here is considered as "current conditions" for the purpose of assessing impacts.*

BLM Authorized (3-Yr avg FY1990-1992)			USFS Actual Use (3-Yr avg CY1989-1991)			BLM & USFS	
State	Section 3	Section 15	Total	Natl. Forest	Grasslands	Total	Total
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
AZ	351,023	143,375	494,398	863,825	0	863,825	1,358,223
CA	183,686	86,440	270,126	362,613	642	363,255	633,381
CO	391,679	43,520	435,199	624,754	131,928	756,682	1,191,881
ID	1,067,344	33,011	1,100,355	534,138	21,392	555,530	1,655,885
KS	0	0	0	0	31,623	31,623	31,623
MT	1,057,450	144,198	1,201,648	443,299	0	443,299	1,644,947
NE	0	480	480	75,233	21,442	96,675	97,155
NV	1,736,015	17,536	1,753,550	205,832	0	205,832	1,959,382
NM	1,438,678	234,203	1,672,881	580,166	49,844	630,010	2,302,891
ND	0	8,005	8,005	0	336,558	336,558	344,563
OK	0	122	122	0	16,772	16,772	16,894
OR	758,903	65,992	824,895	375,315	10,429	385,744	1,210,639
SD	0	67,656	67,656	90,316	250,844	341,160	408,816
TX	0	0	0	0	37,453	37,453	37,453
UT	759,984	0	759,984	491,107	0	491,107	1,251,091
WA	0	24,541	24,541	91,398	0	91,398	115,939
WY	1,063,599	500,517	1,564,116	397,253	115,920	513,173	2,077,289
<b>Totals</b>	<b>8,808,360</b>	<b>1,369,596</b>	<b>10,177,956</b>	<b>5,135,249</b>	<b>1,024,847</b>	<b>6,160,096</b>	<b>16,338,052</b>

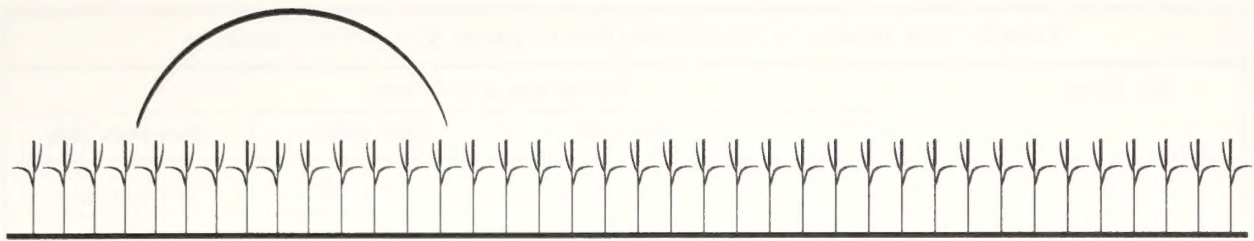
Source: USDA/Forest Service 1993c and USDI/BLM 1993d.

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# APPENDIX K

## Total Increase in Grazing Fees Paid by Permit Size by Fee Alternative

*Table 1 shows the total number of Forest Service and BLM grazing permits by state over the range of permit sizes, from less than 500 AUMs to over 2000 AUMs. Table 2 shows the total increase in fees that would be paid by holders of permits over the range of fee alternatives and over the range of permit sizes. Increase = (fees paid at new rate)-(fees paid at current \$1.86 rate).*

State	Total Permits	Permit Size (# of AUMs)			
		0-499	500-1000	1001-2000	more than 2000
AZ	1306	597	178	416	115
CA	1595	880	179	414	122
CO	2962	1885	535	415	127
ID	3320	2321	446	299	254
KS	1	0	0	1	0
MT	5461	4420	553	378	110
OK	96	1	0	95	0
OR	2281	1599	295	232	155
NM	3526	2217	384	664	261
ND	5	0	0	5	0
NE	101	50	18	18	15
NV	895	265	134	200	296
SD	328	218	60	45	5
TX	88	4	2	76	6
UT	2945	2134	407	221	183
WA	171	23	93	51	4
WY	4328	2316	437	343	332
<b>Totals</b>	<b>29409</b>	<b>19430</b>	<b>3721</b>	<b>3873</b>	<b>1,985</b>

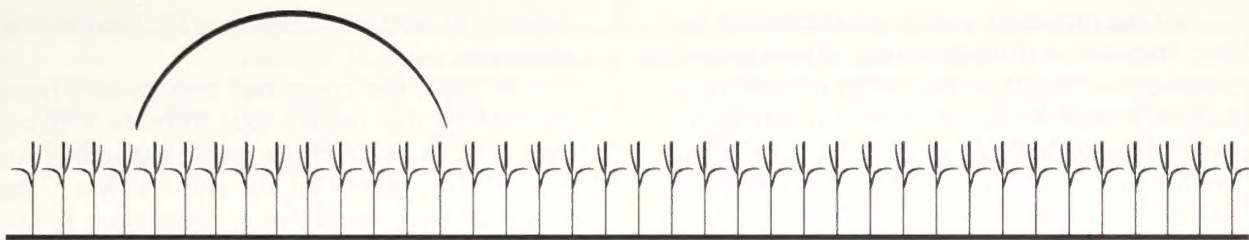


**Table 2: Total Increase in Grazing Fees Paid by Permit Size by Fee Alternative**

Fee Level	Permit Size (# of AUMs)			
	0-499	500-1000	1001-2000	more than 2000
\$2.36	\$250 or less	\$251-\$500	\$501-\$1000	\$1000 or more
\$3.69	\$915 or less	\$916-\$1830	\$1831-\$3660	\$3661 or more
\$3.72	\$930 or less	\$931-\$1860	\$1861-\$3720	\$3721 or more
\$4.28	\$1210 or less	\$1211-\$2420	\$2421-\$4840	\$4841 or more
\$6.38 <sup>1</sup>	\$3190 or less	\$3191-\$4520	\$4521-\$9040	\$9041 or more

<sup>1</sup> \$6.38 is the average value of the regional fees (weighted by the number of AUMs in each state charged at each fee level).





## APPENDIX L

# A Comparison of Grazing Fee Formulas from 1983 to 2003

*This section provides a brief analysis of the performance of alternative grazing fee formulas over time. The formulas analyzed are:*

- *the proposed action fee formula (Alternative 3)*
- *the current PRIA fee formula (Alternative 1)*
- *a modified PRIA formula (Alternative 2)*
- *the federal forage fee formula (Alternative 5)*
- *the regional fee alternative (Alternative 4)*

*These fee formulas are depicted because they each contain indices that can affect the fee annually.<sup>1</sup> All of the estimates of changes in the indices used in these comparisons are based on available historic data. The extension of indices for the next 10 years is based on the average annual change in each of the indices over the past 10 years, as applied to the next 10 years. Historic and projected values of the indices used in the various formulas are shown in Table 1 below.*

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<sup>1</sup> Two other alternatives are not projected here. They are: PRIA plus administrative costs (Alternative 6) and competitive bidding (Alternative 7). For purposes of this analysis, PRIA plus administrative costs (Alternative 6) is anticipated to change annually in a similar manner as the current PRIA formula, although it is anticipated that it will, on average, be twice the PRIA formula fee level. Competitive bidding (Alternative 7) is assumed to vary in a similar manner as the regional-fee alternative (Alternative 4). However, it is recognized that competitive bids would vary within regions.



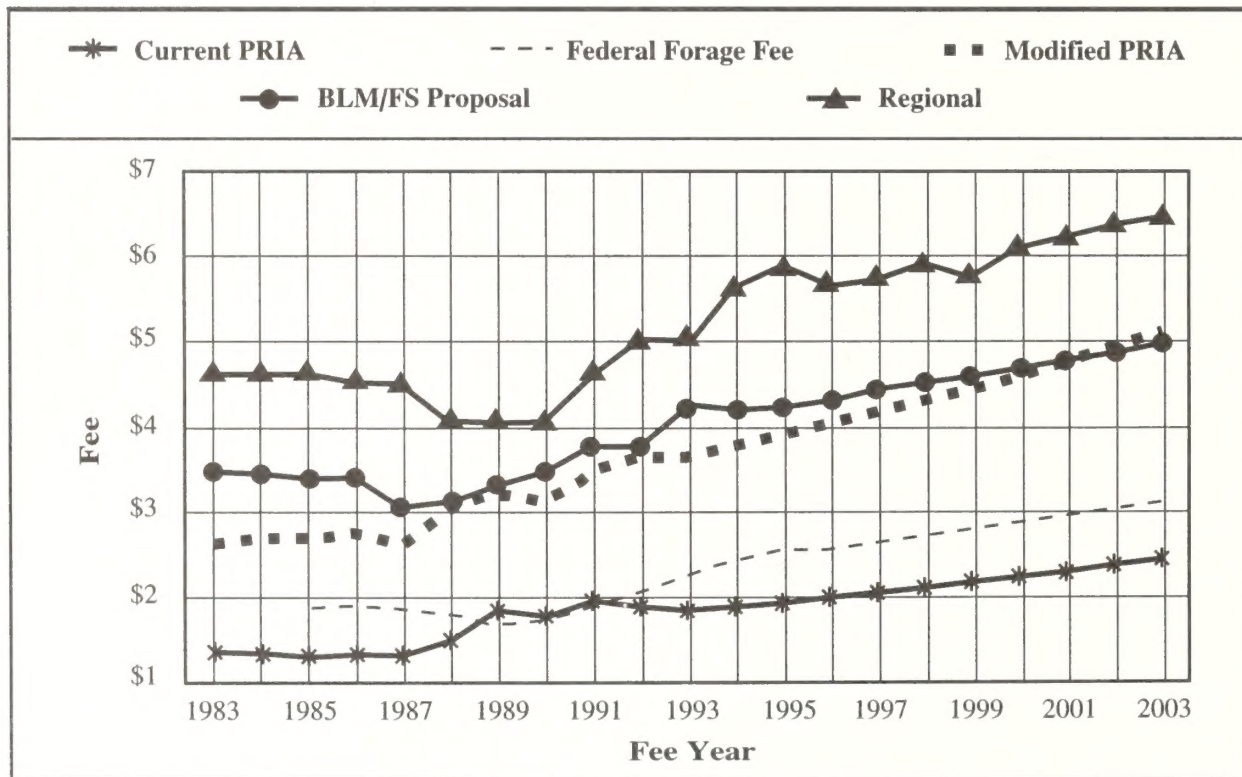
All the projected indices are increasing but they increase at different rates. These projections are not forecasts, but rather extensions of historic average annual changes. It is anticipated that, in the future, the indices will vary on an annual basis just as in the past. However, it is not unreasonable to expect the various indices to perform differently in the future than they have in the past.

Table 2 and Figure 1 show the projected fees for each of the fee alternatives (projected fees for the regional-fee alternative are shown in Table 3). For the regional-fee alternative (Alternative 4), only pricing region 5 is illustrated in Figure 1. Region 5, the Southwest U.S., produces the lowest fee of the six pricing regions. However, all six regions in the regional-fee alternative will be indexed annually by the Forage Value

Index (FVI) and will, consequently, increase the same rate.

In 1993, the computed fees ranged from \$1.86/AUM (the current PRIA formula, Alternative 1) to \$4.28/AUM (the proposed action, Alternative 3), except for the regional fees. The regional fees (Alternative 4) range from \$5.05/AUM to \$11.08/AUM. Because of the method used to estimate future fees, the relationship among the fee alternatives will not change significantly over time. The current PRIA formula (Alternative 1) always produces the lowest fee, and the federal forage fee formula (Alternative 5) is only slightly higher. The regional fees are significantly higher. The other four fee formulas produce fees which are grouped together in the middle of the high and low range.

Figure 1: Fee formulas, 1983-2003.



L-2





**Table 1: Data and Indices Used to Estimate Fees from 1983 to 2003.**

Data Year	Fee Year	Beef Cattle Price Index	PPI Prices Paid Index	ICI Input Cost Index	PGLLR Private Rate 17 State	Forage Value Index 17 State	PGLLR Head mn. Rate 11 State	Forage Value Index 11 State
		1	2	3	4	5	6	7
1982	1983	262	378	275	7.75	.89	8.36	229
1983	1984	256	387	278	7.70	.89	8.85	242
1984	1985	262	395	286	7.54	.87	8.86	243
1985	1986	243	397	267	7.50	.87	9.17	251
1986	1987	235	388	255	6.78	.78	8.50	233
1987	1988	272	381	248	6.94	.80	8.54	234
1988	1989	297	386	268	7.38	.85	8.75	240
1989	1990	306	402	289	7.73	.89	8.87	243
1990	1991	326	419	288	8.31	.96	9.22	253
1991	1992	327	436	289	8.31	.96	9.66	265
1992	1993	316	440	290	9.39	1.08	10.03	275
Estimates for future years based on historical change:								
1993	1994	323	447	291	<sup>a</sup> 9.26	<sup>a</sup> 1.07	<sup>a</sup> 10.20	<sup>a</sup> 279
1994	1995	329	454	293	9.38	1.08	10.37	284
1995	1996	336	461	294	9.57	1.10	10.55	289
1996	1997	343	469	296	9.76	1.13	10.73	294
1997	1998	351	476	297	9.96	1.15	10.91	299
1998	1999	358	484	299	10.16	1.17	11.10	304
1999	2000	365	492	300	10.36	1.19	11.28	309
2000	2001	373	500	302	10.57	1.22	11.50	315
2001	2002	381	508	303	10.78	1.24	11.72	321
2002	2003	389	516	305	11.00	1.27	11.94	327

<sup>1</sup> Beef cattle prices index, 1964-68=100. Extension from 1993 to 2003 based on same rate of change that occurred 1982 to 1992, 2.1% per year.

<sup>2</sup> PPI in the PRIA is an index of selected components of the National Index of Prices Paid by Farmers. Weights used to combine the selected components are based on the 1976 cost of production budget for cow/calf operations in the western region. Extension from 1993 to 2003 is based on same rate of change that occurred 1982 to 1992, 1.6% per year.

<sup>3</sup> ICI uses the same component and weights widely used in agriculture statistics and used in the adjusted PRIA system. Extension from 1993 to 2003 based on same rate of change that occurred 1982 to 1992, 0.5% per year.

<sup>4</sup> Rates per AUM for grazing in nonirrigated private grazing lands by state. The 17 state Private Grazing Land Lease Rate (PGLLR), weighted using the public AUM's of grazing in each state. Extension from 1994 to 2002 is projected at 2% per year based on change 1983 to 1993.

<sup>5</sup> Computed by dividing the 17 state PGLLR by \$8.67.

<sup>6</sup> Rates per Head Month for grazing on nonirrigated private grazing land. The 11 state PGLLR weighted by survey weights. Projections tabulated by (\$3.65 x FVI/100)

<sup>7</sup> Computed by dividing the 11 state PGLLR by \$3.65.

<sup>a</sup> Actual Data.





**Table 2: Historic and Projected Fees Under Alternative Fee Formulas with Common Assumptions.**

<b>Data Year</b>	<b>Fee Year</b>	<b>Proposed Action</b>	<b>PRIA Current</b>	<b>PRIA Modified</b>	<b>Federal Forage Fee</b>
		1	2	3	4
1982	1983	3.52	1.39	2.68	—
1983	1984	3.52	1.37	2.74	—
1984	1985	3.45	1.35	2.74	1.91
1985	1986	3.45	<sup>d</sup> 1.35	2.81	1.95
1986	1987	3.09	<sup>e</sup> 1.35	2.64	1.88
1987	1988	3.17	1.54	3.16	1.84
1988	1989	3.37	1.86	3.27	1.71
1989	1990	3.52	1.81	3.16	1.76
1990	1991	3.80	1.97	3.52	1.95
1991	1992	3.80	1.92	3.69	2.09
1992	1993	<sup>a</sup> 1.86	1.86	3.69	2.31
Estimate for future years based on historic change:					
1993	1994	<sup>b</sup> 2.74	1.90	3.80	2.44
1994	1995	<sup>c</sup> 3.52	1.96	3.93	2.58
1995	1996	4.36	2.02	4.06	2.60
1996	1997	4.47	2.07	4.20	2.68
1997	1998	4.55	2.13	4.34	2.75
1998	1999	4.63	2.19	4.48	2.82
1999	2000	4.71	2.25	4.63	2.90
2000	2001	4.83	2.32	4.79	2.98
2001	2002	4.91	2.39	4.96	3.06
2002	2003	5.03	2.46	5.13	3.14

<sup>1</sup> The Proposed Action fee formula (Alternative 3).

<sup>2</sup> The PRIA (Public Rangeland Improvement Act) specified this fee system and by executive order it has been extended through 1993.

<sup>3</sup> PRIA modified by replacing the PPI with the ICI, and dividing beef cattle prices index by the ICI instead of subtracting.

<sup>4</sup> Federal forage fee formula (Alternative 5). Because of unclear instructions regarding this formula, the historic and projected fees were approximated by using a three-year rolling average of the 17 state PGLLR times .488 minus the 1.60 costs (as indexed by the ICI) times .879. These fee estimates are not identical to the fees the users indicated; but the general relationship to the other fee formulas is accurate.

<sup>a</sup> Fee value is \$4.28; \$1.86 is actual fee charged.

<sup>b</sup> Fee value is \$4.28; \$2.74 is first year phase-in and is actual charge.

<sup>c</sup> Fee value is \$4.28; \$3.52 is second year phase-in and is actual projected charge.

<sup>d</sup> \$1.35 is legal minimum, fee computed as \$0.93.

<sup>e</sup> \$1.35 is legal minimum, fee computed as \$0.98.





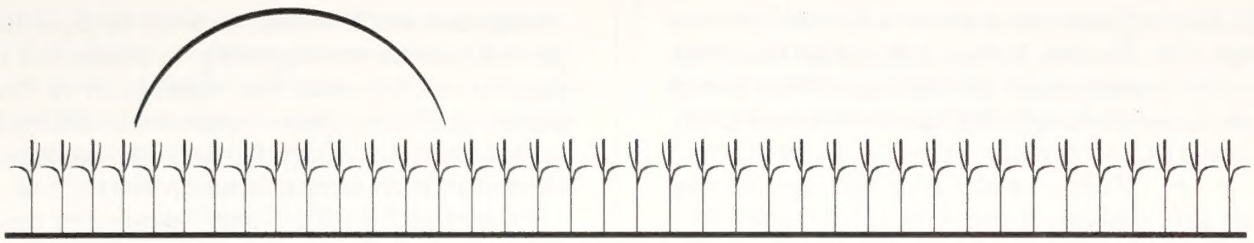
**Table 3: Estimate of Regional Fees from 1983 to 2003 (Alternative 4).**

Data Year	Fee Year	Region						Index
		1	2	3	4	5	6	
1982	1983	10.22	6.39	7.74	6.39	4.68	6.85	1.0
1983	1984	10.22	6.39	7.74	6.39	4.68	6.85	1.0
1984	1985	10.22	6.39	7.74	6.39	4.68	6.85	1.0
1985	1986	10.02	6.26	7.58	6.26	4.59	6.71	.98
1986	1987	9.91	6.20	7.51	6.20	4.54	6.64	.97
1987	1988	8.99	5.62	6.81	5.62	4.12	6.03	.88
1988	1989	9.20	5.75	6.97	5.75	4.12	6.17	.90
1989	1990	9.20	5.75	6.97	5.75	4.12	6.17	.90
1990	1991	10.22	6.39	7.74	6.39	4.68	6.85	1.00
1991	1992	11.04	6.90	8.36	6.90	5.05	7.40	1.08
1992	1993	11.04	6.90	8.36	6.90	5.05	7.40	1.08
Estimates for future years based on historical change:								
1993	1994	12.37	7.73	9.36	7.73	5.66	8.29	1.21
1994	1995	12.88	8.05	9.75	8.05	5.90	8.63	1.26
1995	1996	12.47	7.80	9.44	7.80	5.71	8.36	1.22
1996	1997	12.67	7.92	9.60	7.92	5.80	8.49	1.24
1997	1998	12.98	8.11	9.83	8.11	5.94	8.70	1.27
1998	1999	12.67	7.92	9.60	7.92	5.80	8.49	1.24
1999	2000	13.39	8.37	10.14	8.37	6.13	8.97	1.31
2000	2001	13.69	8.56	10.37	8.56	6.27	9.18	1.34
2001	2002	14.00	8.75	10.60	8.75	6.41	9.38	1.37
2002	2003	14.21	8.88	10.76	8.88	6.51	9.52	1.39









## APPENDIX M

# Summary of Findings of Nongovernment Grazing Fee Studies

### *Nongovernment Grazing Fee Studies*

*Over the years, many studies, research reports, special analyses, and papers have been prepared by nongovernment entities on the potential impacts of grazing fee increases and reductions in federal grazing. In the process of analyzing the impacts of grazing fee increases and reductions in federal grazing use, the following recent studies on these issues were reviewed:*

- *“New Perspectives on Grazing Fees and Public Land Management in the 1990’s” (Rostvold and Dudley 1992);*
- *“A Comparative Analysis of the Economic, Financial and Competitive Conditions of Montana Ranches Using Federal Forage and Montana Ranches Without Federal Grazing Allotments” (Rostvold and Dudley 1993);*
- *Albuquerque Production Credit Association internal analysis (attachment to letter to U.S. Senator Pete Domenici, dated August 13, 1993);*
- *“Economic Impacts of Alternative Federal Grazing Fee Formulas on Representative Ranches in New Mexico, Wyoming, Montana, and Nevada” (Knutson and others 1992);*



- "Economic Aspects of Federal Livestock Grazing Policy: A Regional Economic Analysis for the Okanogan-Ferry Area of Washington" (Geier and Holland 1991);
- "Public Land Policy and the Value of Grazing Permits" (Torell and Doll 1991);
- "Big Profits at a Big Price: Public Land Ranchers Profit at the Expense of the Range" (Carlson and Horning 1992);
- "Characteristics of Western Livestock Industry" (Fowler, Rush, and Hawkes 1993);
- "Economic Analysis of the Values of Surface Use of State Lands. Task 3: Fair Market Value for Grazing Leases" (Duffield and Anderson 1993)

Rostvold and Dudley (1992) state that the departure from generally acceptable research methods and valid statistical procedures leads one to the conclusion that regional appraisal values cannot be used to derive an equitable grazing fee on public rangelands. Rostvold and Dudley (1993) conclude that, contrary to popular belief, Montana livestock operators using federal grazing lands do not enjoy economic and financial advantages over ranchers that do not have federal grazing. They conclude the opposite is true.

The Albuquerque Production Credit Association prepared an internal analysis of the impact of increasing federal grazing fees on the Association's borrowers (letter to U.S. Senator Pete Domenici, 8/13/93). The analysis concluded that federal land ranchers have 7.6 percent more expenses and receive 13.3 percent less per head repayment than private land ranchers in New Mexico. It also concluded that 75 percent of the federal land ranchers would be adversely affected by the proposed fee increase to \$4.28. Of the 75 percent, 40 percent would be put out of business, and 35 percent would no longer be eligible for financing.

An analysis by Knutson and others (1992) concluded, among other things, that, while all ranches except those in Southwestern Wyoming realized a positive net cash income under the current PRIA formula, all but one of the seven ranches experienced a decline in real net worth over the 1992-97 planning horizon. It also con-

cluded that for BLM-administered lands, a 10 percent increase in the grazing fee results in a 1 percent reduction in the number of AUMs grazed. A slightly smaller reduction in demand for Forest Service AUMs (0.9 percent) would be observed for the same increase in grazing fees.

Greier and Holland (1991), concluded that at \$4.25 per AUM all existing permittees would continue to purchase federal grazing. At \$5.80 and \$7.25 per AUM, 20 percent and 50 percent of the permittees, respectively, would no longer find it economically worthwhile to continue purchasing federal grazing. At \$8.70 per AUM, no permittees would purchase federal AUMs.

Analyzing the impact of an increased state grazing fee on state permit values in New Mexico, Torell and Doll (1991) concluded that a \$1 per AUM increase in state grazing fee results in about a \$30 per AUM decrease in grazing permit value. However, new analysis found New Mexico state land permits to have increased in value relative to BLM and Forest Service permits, even though New Mexico state land fees are now nearly double the federal grazing fee (USDA/USDI 1993).

Carlson and Horning (1992) reviewed BLM data on 18,000 livestock grazing permittees. They found that the top 20 BLM permittees (or .1%) control 9.3 percent of the available forage on 14 percent of allotments that cover approximately 20.7 million acres of BLM's rangeland and include multibillion dollar corporations, such as Metropolitan Life Insurance Co. and Sierra Pacific Resources.

Fowler, Rush, and Hawkes (1993) present the results of a survey of the western livestock industry in which 4,574 measurable responses represented 41 percent of all westwide federal AUMs. The survey found that, in 1991, net positive receipts were experienced for all western states, with the average ranch surveyed netting almost \$60,000 as a return to management and owned capital. Analysis of the data revealed that even in a most profitable year, such as 1991, the return on total assets was about 4 percent.

Duffield and Anderson (1993) prepared an economic analysis of the fair market value for Montana state grazing leases. The analysis "suggests that fair market value for [grazing state lands] is on the order of \$7.50 to \$8.50 per AUM" (page 65). In Montana, a great deal of federal land is intermingled with state lands.

In addition, a number of permittees submitted information on their financial situations



and their analyses of the financial impact on their operations from increased grazing fees and/or reduced federal grazing. Analyses were also received regarding importance of livestock grazing on federal lands in some counties (e.g., South Central Mountain Resource Conservation and Development Council 1991; USDA/SCS 1992).

## *Consideration of Nongovernment Information*

Nongovernment studies and analyses are helpful in providing more insight into potential grazing fee impacts and federal grazing reductions. Perhaps the biggest limitation of much of the information is that it is not national in scope and pertains only to a local area or state. The data also are often anecdotal and are not scientifically collected or analyzed.

One of the major issues in assessing grazing fee impacts is the level of fee that would force present permittees out of business. A companion issue is the level of grazing fee that would result in no AUMs being purchased, even by potentially more efficient producers.

Some nongovernment studies found that a modest increase in fees will force some permittees out of business. However, there are no westwide studies of this and the extent to which this might happen westwide is unknown. Further, studies that project certain permittees will go out of business are based on underlying assumptions, critical to the study results.

Whether present permittees will be forced out of business depends on what is assumed about such factors as whether permittees cannot or will not improve the efficiency of their ranch operations with higher fees, their present level of indebtedness, whether alternative forage is available, whether the permittee has offranch income, their level of dependency on federal forage, and whether the ranch operation is part of a large corporation. For example, according to the 1987 Census of Agriculture, 45 percent of the income of all beef cattle farms and ranches comes from nonfarm sources. Operators that have significant offranch income and essentially use the ranch as a place to live and raise cattle to supplement their income are less likely to go out of business.

Even if a particular permittee goes out of business with higher grazing fees, this does not necessarily imply that the federal forage will not be used. It is likely that the ranch would be bought and managed by a more efficient operator.

Of course, if the fee reaches a level that exceeds its economic value, a prudent permittee would not purchase federal forage. Some nongovernment studies have projected levels of demand for grazing at various fee levels. These demand projections are based on assumptions such as the supply of public forage, its economic value, the availability of alternative forage, and permittees' abilities to substitute alternative forage for federal forage (i.e., the "elasticity of demand"). However, outside of a few isolated situations, federal grazing has never been traded competitively in a free market, so there is no empirical information to support an assumption on the elasticity of demand for federal forage.

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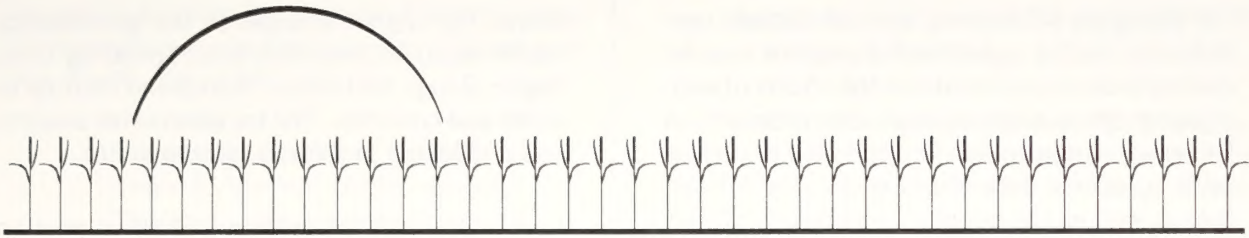
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## APPENDIX N

# Micro IMPLAN System and Methodology for Estimating Impacts to Employment and Income

### *Micro IMPLAN System*

*IMPLAN is an acronym for Impact analysis for PLANning. The Micro IMPLAN (MI) System was developed by the USDA Forest Service, Land Management Planning Group, in Fort Collins, Colorado. MI is a microcomputer program that constructs regional input-output (I-O) accounts and models. These accounts and models are mathematical "snapshots" of the regional economy of 16 western states for the base year 1990. This snapshot of the western economy provides a basis for describing the current economic situation and explaining how alternative rangeland reform activities fit within and affect the regional economy.*

*Applying the MI system, one can construct an economic model for any region, consisting of one or more counties, in the United States using economic data, such as employment, income, and total industrial output, which are available by state and county. If needed, users may substitute their own data in constructing regional models. Once a regional I/O model has been constructed, economic impact analyses may be performed within the MI system using the model. These impact analyses estimate the changes anticipated in the western economy by several measures, such as employment and total income.*



Using the MI System, one can include new industries in the region and change or remove current industries to evaluate the effects of such adjustments on regional economic measures. A full array of reports can be generated to display both economic data stored within the MI system as well as the results of economic impact analyses.

The MI System was used to perform several economic analyses for the Rangeland Reform '94 Environmental Impact Statement. These analyses include an economic diversity assessment for the western economy and economic impact analyses for the fee and management alternatives.

## *Economic Diversity Assessment*

This analysis involved building a MI economic I/O model for 16 states in the western United States. The economic accounts in this westwide economic model were used to depict the distribution of economic activity across industries. The amount of employment and total income in each industry, such as Agriculture, Construction, Manufacturing and Services, was presented. This baseline information was included in Chapter 3—Affected Environment—as the background from which the analysis of effects could be evaluated. This assessment was conducted for the western 16-state economy for three different time periods: 1990, 1985, and 1982. These three base years were used to graphically present employment and total income information to illustrate the trend in the western economy. All total income values are presented in 1993 dollars.

## *Fee Alternatives Analysis*

As described earlier, seven federal grazing fees have been selected for detailed analysis. For each fee alternative, changes in employment and total income have been estimated using the MI System. Each alternative fee is higher than the current fee. Payment of these higher grazing fees would presumably result in lower expenditures made by permittees locally, and would, in turn, increase the level of receipts to the U.S. Govern-

ment. The higher receipts to the government could result in increased local spending from higher Range Betterment Funds and returns to states and counties. The fee alternative analysis was conducted in the following manner.

1. For each alternative, increased grazing fees would result in a net income loss to the permittee. The corresponding reduction in local expenditures by the permittee is estimated in areas such as reduced personal spending and savings/investments, and reduced permittee-financed public range investments.
2. For each alternative, the higher receipts (income) received by the U.S. government are apportioned to increased government spending locally on range improvements, and payments to state and local governments.
3. The changes in expenditures is noted in #1 and #2 above are analyzed using the MI westwide economic model to estimate possible changes in regional employment and total income. All total income values are presented in 1993 dollars for display with employment effects in Chapter 4. Economic effects are shown separately for those occurring from reductions in permittee spending and from increased government spending.

## *Management Alternatives Analysis*

Five management alternatives are analyzed in the Range Reform '94 EIS. For each of these alternatives, a reduction in permitted AUMs (animal unit months) is estimated. These lower levels of permitted grazing would suggest reduced levels of ranch production, causing decreases in local spending by permittees. Also, as permitted AUMs are reduced, government receipts would be lowered accordingly, resulting in fewer returns to states and local governments as well as lower levels of government-induced range betterment/investment spending locally. The MI model for the westwide regional economy can



be used to estimate the impacts of these changes for employment and total income. The analysis was conducted, as follows.

1. Using studies developed by the Economic Research Service (ERS), estimates of changes in ranch cow/calf production costs were estimated for each reduction in permitted AUMs, by alternative (Economic Aspects of Supply and Demand for Livestock Forage on Public Lands in the Appendixes.) These reductions in permitted AUMs and corresponding ranch production costs represent lower levels of local expenditures made by ranchers. These expenses were analyzed in the westwide MI model, by alternative, to estimate the corresponding changes that

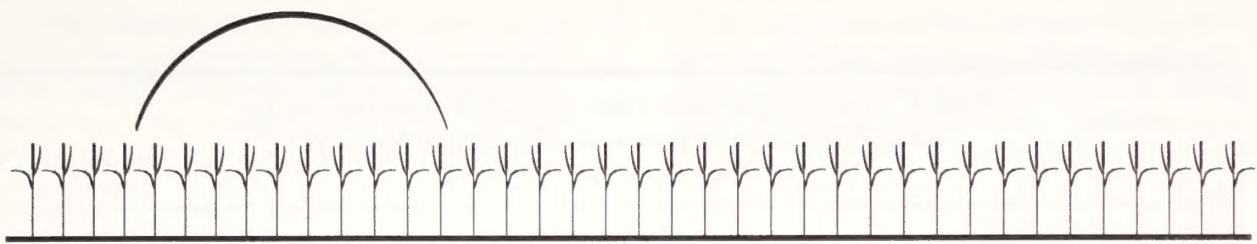
may be anticipated in local employment and total income.

2. The reduced level of permitted AUMs also is reflected in lower grazing receipts and income received by the U.S. Government. These lower incomes represent reduced levels of payments to state and local governments and lower range betterment/investment expenditures made locally. Employment and total income changes resulting from these two kinds of reductions were analyzed using the MI System.
3. The Net Total Effects of each management alternative consist of the sum of the employment and total income effects identified in #1 and #2 above.









## APPENDIX O

# Changes in Ranch Returns from Reduced AUMs and Higher Grazing Fees

*This appendix describes the methodology used by BLM economists to assess the impacts to ranch operations from the management and fee alternatives in this EIS. This methodology was developed using an analysis done by the USDA, Economic Research Service (ERS). The ERS analysis appears in this EIS as Appendix G, Economic Aspects of Supply and Demand for Livestock Forage on Public Lands. The ERS report used data from a cow/calf version of the 1990 Farm Costs and Returns Survey (FCRS). These data were used to analyze the impact of AUM reductions on federal permittees' ranch budgets and income. The 1990 FCRS survey was based on a stratified random sample of cow/calf operations in the 31 leading cow/calf states. The cost and return data used in the ERS analysis is a subset of that information for 10 western states (North and South Dakota, Montana, Wyoming, Colorado, New Mexico, Idaho, Utah, Oregon, and California).*

*A budget for an average federally permitted, cow/calf operation was developed based on the FCRS survey data. Table 1 depicts this average budget.*

*As shown in Table 1, net cash returns are cash receipts from operations less total cash expenses. Cash receipts from operations would, all else being equal, increase as the number of mature breeding cows increases, and decrease as herd size decreases. An impact common to all alternatives in this EIS is that herd size would decrease as the availability of federal forage is reduced. The extent of the decrease would vary by alternative. As the supply of forage is reduced and herds are reduced, net returns to ranching operations would drop.*





**Table 1: Cow/Calf Production Cash Costs and Returns per Cow for Average Permittee in 10 Western and Great Plains States, 1990 (Average Herd Size 221 Cows)**

Item	Dollars per Ranch	Dollars per Cow
Cash Receipts	\$ 95,502	\$ 431
Variable Cash Expenses:		
Feeder Cattle	\$ 1,152	\$ 5
Federal Forage	2,768	13
Other Public Pasture	625	3
Total Other Feed Cost	27,050	122
Other Variable Cash Expenses	21,920	102
Total Variable Cash Expenses	\$ 53,515	\$ 245
Total Fixed Cash Expenses	\$ 22,227	\$ 100
Total Cash Expenses	\$ 75,742	\$ 345
Net Cash Returns before		
Capital Expenditures	\$ 19,760	\$ 86

Source: Appendix G, Economic Aspects of Supply and Demand for Livestock Forage on Public Lands

**Table 2: Income Effects of Reduced AUMs at Various Levels Of Dependency and Size**

Ranch Characteristics			Reduced Returns for Different Percentage Cuts in AUMs (Dollars per Ranch)			
Herd Size <sup>1</sup>	% Dependency on Federal Forage	Total Net Cash Returns <sup>2</sup>	10%	50%	75%	100%
308	10.9	\$ 44,697	\$ 447	\$ 2,190	\$ 3,308	\$ 4,425
217	43.8	\$ 11,460	\$ 676	\$ 3,381	\$ 5,507	\$ 6,807
221	36.8	\$ 19,760	\$ 1,065	\$ 5,245	\$ 7,821	\$ 10,658
93	85.0	\$ 8,372	\$ 360	\$ 1,825	\$ 2,378	\$ 4,667

<sup>1</sup> Number of cows

<sup>2</sup> Net cash returns are the amount of ranch receipts left after all cash costs are deducted

Source: Appendix G, Economic Aspects of Supply and Demand for Livestock Forage on Public Lands



Table 2 shows the change in net cash returns for four livestock operations with different herd sizes and different levels of dependency on federal forage. The change in net cash returns was estimated using an analysis of ranch sensitivity to reductions in AUM's of 10, 50, 75, and 100 percent.

The estimates in Table 2 are summarized from the sensitivity analysis performed by ERS. In estimating decreases in net cash returns at AUM reduction levels of 10 to 100 percent, the ERS analysis maximized net cash returns before capital replacement (on all but the average herd size operation of 221 cows) subject to the constraints on the availability of federal forage. The analysis assumptions include: each of the four sample ranches is actually profitable, cattle price and prices for alternative forage are constant, and each ranch is breaking even on its full costs. Making each ranch a break-even proposition in the model increases the ranch's sensitivity to reductions in federal forage. In addition, the value of federal forage in the model is set to the private lease rate. By giving public land the value of private land, the implied productivity of federal land is maximized. This higher productivity in the model will result in greater impacts to ranch income and herd size from AUM reductions.

The ERS sensitivity analysis of the income response to reductions in federal forage also considered the ranch operation's elasticity of substitution. The elasticity of substitution measures how well one input can substitute for another, in this case, how easily other types of forage can be substituted for federal forage. Their analysis showed that, for relatively small reductions in federal forage (up to 25 percent reductions), the ranch's relative ability to substitute for loss of federal forage did not make a significant difference in herd size adjustment. In other words, the herd size reduction resulting from small reductions in AUM's was the same, whether the permittee could or could not easily substitute another forage or feed source.

For the average-sized permittee operations (with 221 cows and about 37 percent dependency on federal forage for total feed requirements), it is estimated that a 50 percent decrease in AUM's would cause a loss of 61 mature breeding cows and a decline of \$5,245 in net cash returns. Thus, net returns drop by \$86 for each cow culled from the herd and not replaced

(\$5,245/61). This analysis assumes that the herd size is reduced by culling and not replacing cows as the principal manner in which ranches would adjust to reduced federal forage. However, after the herd is reduced, it would still have an annual permitted use level of 709 AUMs. Assuming the federal grazing fee increases to \$4.28/AUM (an increase of \$2.42/AUM), net cash returns for this ranch would decrease by another \$1,716 per year (709 AUM's \* \$2.42/AUM). At \$6.38/AUM, the weighted average value of the 1993 regional fees (an increase of \$4.52/AUM), net cash returns would decrease an additional \$3,205 (709 AUM's \* \$4.52/AUM).

In summary, the 50 percent decrease in the number of AUM's coupled with a \$2.42/AUM fee increase would reduce net returns by \$6,961 (\$5,245 from the reduced supply of AUM's and \$1,716 from the increased fee for the remaining AUM's). The 50 percent decrease coupled with a \$4.52/AUM increase would reduce net cash returns by \$8,450 (\$5,245 from the reduced supply of AUM's and \$3,205 from the increase fee for the remaining AUM's).

The next section portrays impacts for each of the management alternatives across a range of fee levels. These impacts are based on the methodology just described and are depicted for a variety of herd sizes, from 120 cows to 450 cows. The impacts appearing in Chapter 4 of this EIS use the same methodology but are depicted for a different set of herd sizes, 90 cows to 425 cows.

## Alternative 1: Current Management

Under the Current Management Alternative, the total number of federal AUMs is estimated to decrease 5 percent after five years and 20 percent over twenty years. These figures are a westwide average and do not necessarily represent the AUM reductions estimated for all ranching operations. Variables that determine the effect on a ranch losing federal forage are dependency on federal forage, herd size, and the ability of the operation to substitute other sources of forage. Table 3 shows the projected losses, under the Current Management Alternative, for ranch operations of various herd sizes, dependency on federal forage, and cuts in federal forage over the short term and long term.



Losses are expressed both in terms of reduced herd sizes and decreased net cash returns. Decreased net cash returns due to a fee increase from the current \$1.86 to both \$4.28/AUM and \$6.38/AUM are also displayed in Table 3. The \$6.38 figure used in the table is the average value of fees in the regional fee alternative (weighted by the number of AUMs, by state, that would be charged at each regional fee level).

## Alternative 2: Proposed Action

Under the Proposed Action Alternative, federal AUMs are estimated to decrease 12 percent after 5 years and 21 percent over 20 years. These

figures are a westwide average and do not necessarily represent AUM reductions estimated for individual ranching operations. Variables that determine the effects on a ranch losing federal forage include dependency on federal forage, herd size, and the ability of the operation to substitute other sources of forage. Table 4 shows the projected losses, under the Proposed Action alternative, for ranching operations of different herd sizes, dependency on federal forage, and cuts in federal forage over the short term and long term. Losses are expressed both in terms of reduced herd sizes and decreased net cash returns. Decreased net cash returns due to a fee increase from the current \$1.86 to both \$4.28/AUM and \$6.38/AUM are also displayed

**Table 3: Effects on Herd Size and Income from Reduced AUMs and Fee Increases**  
(Alternative 1: Current Management)

Herd Size	% Dependency on Federal Forage	% Cut in AUMS	# Of Cows "Lost" per Permitted Herd	Net Cash Returns Lost Due to Smaller Herd Size <sup>1</sup>	Net Cash Returns Lost at \$4.28/AUM <sup>2</sup>	Net Cash Returns Lost at \$6.38/AUM <sup>3</sup>
450	60.0	5.0	14.0	\$ 1,204	\$ 8,653	\$ 15,117
450	60.0	20.0	50.5	4,343	10,616	16,059
450	30.0	5.0	7.0	602	4,326	7,558
450	30.0	20.0	25.3	2,176	5,312	8,034
300	60.0	5.0	9.4	808	5,774	10,083
300	60.0	20.0	33.7	2,898	7,080	10,709
300	30.0	5.0	4.7	404	2,887	5,042
300	30.0	20.0	16.9	1,453	3,544	5,358
225	60.0	5.0	7.0	602	4,326	7,558
225	60.0	20.0	25.3	2,176	5,312	8,034
225	30.0	5.0	3.5	301	2,163	3,779
225	30.0	20.0	12.6	1,084	2,652	4,013
120	60.0	5.0	2.5	215	2,201	3,925
120	60.0	20.0	9.0	774	2,447	3,898
120	30.0	5.0	1.2	103	1,096	1,958
120	30.0	20.0	4.5	387	1,223	1,949

<sup>1</sup> Net cash returns lost at the current fee level due to herd size reductions.

<sup>2</sup> Net cash returns lost due to herd size reductions plus increased fee (to \$4.28/AUM) on remaining federal forage.

<sup>3</sup> Net cash returns lost due to herd size reductions plus increased fee (to \$6.38/AUM) on remaining federal forage. \$6.38 is the average value of the regional fees (weighted by the number of AUMs in each state charged at each fee level).



in Table 4. \$6.38 is the average value of fees in the regional fee alternative (weighted by the number of AUMs, by state, that would be charged at each regional fee level).

### Alternative 3: Stewardship

Under the Stewardship Alternative, federal AUMs are estimated to decrease 3 percent after 5 years and 12 percent over 20 years. These figures are a westwide average and do not necessarily represent the AUM reduction estimated for individual ranching operations. Variables that determine the effect on a ranch losing federal forage are dependency on federal forage, herd

size, and the ability of the operation to substitute other sources of forage. Table 5 shows the projected losses under the Stewardship Alternative for ranching operations of different herd sizes, dependency on federal forage, and cuts in federal forage over the short term and long term. Losses are expressed both in terms of reduced herd sizes and decreased net cash returns. Decreased net cash returns due to a fee increase from the current \$1.86 to both \$4.28/AUM and \$6.38/AUM are also displayed in Table 5. \$6.38 is the average value of fees in the regional fee alternative (weighted by the number of AUMs, by state, that would be charged at each regional fee level).

**Table 4: Effect on Herd Size and Income from Reduced AUMs and Fee Increases**  
(Alternative 2: Proposed Action)

Herd Size	% Dependency on Federal Forage	% Cut in AUMS	# Of Cows "Lost" per Permitted Herd	Net Cash Returns Lost Due to Smaller Herd Size <sup>1</sup>	Net Cash Returns Lost at \$4.28/AUM <sup>2</sup>	Net Cash Returns Lost at \$6.38/AUM <sup>3</sup>
450	60.0	12.0	33.7	\$ 2,898	\$ 9,798	\$ 15,785
450	60.0	21.0	59.0	5,074	11,268	16,643
450	30.0	12.0	16.8	1,445	4,895	7,889
450	30.0	21.0	29.5	2,537	5,634	8,322
300	60.0	12.0	22.5	1,935	6,535	10,527
300	60.0	21.0	39.3	3,380	7,509	11,093
300	30.0	12.0	11.2	963	3,263	5,259
300	30.0	21.0	19.7	1,694	3,759	5,550
225	60.0	12.0	16.9	1,453	4,903	7,897
225	60.0	21.0	29.5	2,537	5,634	8,322
225	30.0	12.0	8.4	722	2,447	3,944
225	30.0	21.0	14.7	1,264	2,813	4,156
120	60.0	12.0	6.0	516	2,356	3,953
120	60.0	21.0	10.5	903	2,555	3,988
120	30.0	12.0	3.0	258	1,178	1,976
120	30.0	21.0	5.2	447	1,273	1,990

<sup>1</sup> Net cash returns lost at the current fee level due to herd size reductions.

<sup>2</sup> Net cash returns lost due to herd size reductions plus increased fee (to \$4.28/AUM) on remaining federal forage.

<sup>3</sup> Net cash returns lost due to herd size reductions plus increased fee (to \$6.38/AUM) on remaining federal forage. \$6.38 is the average value of the regional fees (weighted by the number of AUMs in each state charged at each fee level).





**Table 5: Effects on Herd Size and Income from Reduced AUMs and Fee Increases**  
(Alternative 3: Stewardship)

Herd Size	% Dependency on Federal Forage	% Cut in AUMS	# Of Cows "Lost" per Permitted Herd	Net Cash Returns Lost Due to Smaller Herd Size <sup>1</sup>	Net Cash Returns Lost at \$4.28/AUM <sup>2</sup>	Net Cash Returns Lost at \$6.38/AUM <sup>3</sup>
450	60.0	3.0	8.4	\$ 722	\$ 8,328	\$ 14,927
450	60.0	12.0	33.7	2,898	9,798	15,785
450	30.0	3.0	4.2	361	4,164	7,464
450	30.0	12.0	16.8	1,445	4,895	7,889
300	60.0	3.0	5.6	482	5,552	9,952
300	60.0	12.0	22.5	1,935	6,535	10,527
300	30.0	3.0	2.8	241	2,776	4,976
300	30.0	12.0	11.2	963	3,263	5,259
225	60.0	3.0	4.2	361	4,164	7,464
225	60.0	12.0	16.9	1,453	4,903	7,897
225	30.0	3.0	2.1	181	2,082	3,732
225	30.0	12.0	8.4	722	2,447	3,944
120	60.0	3.0	1.5	129	2,157	3,917
120	60.0	12.0	6.0	516	2,356	3,953
120	30.0	3.0	0.7	60	1,074	1,954
120	30.0	12.0	3.0	258	1,178	1,976

<sup>1</sup> Net cash returns lost at the current fee level due to herd size reductions.

<sup>2</sup> Net cash returns lost due to herd size reductions plus increased fee (to \$4.28/AUM) on remaining federal forage.

<sup>3</sup> Net cash returns lost due to herd size reductions plus increased fee (to \$6.38/AUM) on remaining federal forage. \$6.38 is the average value of the regional fees (weighted by the number of AUMs in each state charged at each fee level).

## Alternative 4: Suitability

Under the Suitability Alternative, federal AUMs are estimated to decrease 50 percent after 5 years. After 20 years, the supply of AUMs under this alternative would increase but still would be 30 percent less than current levels. These figures are a westwide average and do not necessarily represent the AUM reduction estimated for individual ranching operations. Variables that determine the effects on a ranch losing federal forage include dependency on federal forage, herd, size and the ability of the op-

eration to substitute other sources of forage. Table 6 shows the projected losses, under the Suitability Alternative, for ranching operations of different herd sizes, dependency on federal forage, and cuts in federal forage over the short term and long term. Losses are expressed both in terms of reduced herd sizes and decreased net cash returns. Decreased net cash returns due to a fee increase from the current \$1.86 to both \$4.28/AUM and \$6.38/AUM are also displayed in Table 6. \$6.38 is the average value of fees in the regional fee alternative (weighted by the number of AUMs, by state, that would be charged at each regional fee level).





**Table 6: Effects on Herd Size and Income from Reduced AUMs and Fee Increases  
(Alternative 4: Suitability)**

Herd Size	% Dependency on Federal Forage	% Cut in AUMS	# Of Cows "Lost" per Permitted Herd	Net Cash Returns Lost Due to Smaller Herd Size <sup>1</sup>	Net Cash Returns Lost at \$4.28/AUM <sup>2</sup>	Net Cash Returns Lost at \$6.38/AUM <sup>3</sup>
450	60.0	50.0	140.4	\$ 12,074	\$ 15,994	\$ 19,396
450	60.0	30.0	84.2	7,241	12,730	17,492
450	30.0	50.0	70.2	6,037	7,997	9,698
450	30.0	30.0	42.1	3,621	6,365	8,747
300	60.0	50.0	93.6	8,050	10,664	12,932
300	60.0	30.0	56.2	4,833	8,492	11,667
300	30.0	50.0	46.8	4,025	5,332	6,466
300	30.0	30.0	28.1	2,417	4,247	5,834
225	60.0	50.0	70.2	6,037	7,997	9,698
225	60.0	30.0	42.1	3,621	6,365	8,747
225	30.0	50.0	35.1	3,019	3,999	4,850
225	30.0	30.0	21.1	1,815	3,187	4,378
120	60.0	50.0	24.9	2,141	3,186	4,094
120	60.0	30.0	14.9	1,281	2,745	4,015
120	30.0	50.0	12.4	1,066	1,589	2,042
120	30.0	30.0	7.5	645	1,377	2,012

<sup>1</sup> Net cash returns lost at the current fee level due to herd size reductions.

<sup>2</sup> Net cash returns lost due to herd size reductions plus increased fee (to \$4.28/AUM) on remaining federal forage.

<sup>3</sup> Net cash returns lost due to herd size reductions plus increased fee (to \$6.38/AUM) on remaining federal forage. \$6.38 is the average value of the regional fees (weighted by the number of AUMs in each state charged at each fee level).

## Alternative 5: No Grazing

Under the No Grazing Alternative, the supply of federal forage would decrease by 100 percent after a phase-in period. Variables that determine the effects on a ranch losing federal forage are dependency on federal forage, herd

size, and the ability of the operation to substitute other sources of forage. Table 7 shows projected losses, under this alternative, for ranches of different herd sizes, differing dependency upon federal forage, and different cuts in federal forage after the phase-in period. These losses are expressed both as reduced herd sizes and decreased net cash returns.

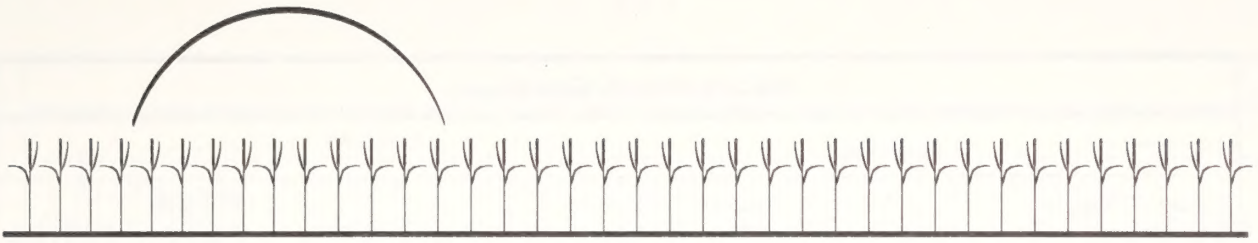




**Table 7: Effects on Herd Size and Income from Reduced AUMs**  
(Alternative 5: No Grazing)

<b>Herd Size</b>	<b>% Dependency on Federal Forage</b>	<b>% Cut in AUMS</b>	<b># Of Cows "Lost" per Permitted Herd</b>	<b>Net Cash Returns Lost Due to Smaller Herd Size</b>
450	60.0	100.0	280.8	\$ 24,149
450	30.0	100.0	140.4	12,074
300	60.0	100.0	187.2	16,099
300	30.0	100.0	93.6	8,050
225	60.0	100.0	140.4	12,074
225	30.0	100.0	70.2	6,037
120	60.0	100.0	49.8	4,283
120	30.0	100.0	24.9	2,141





## APPENDIX P

### **Change in Employment & Income After 5 yrs. & 20 yrs. of Implementation Under Different Fee Levels**





**Table 1: Current Management**

Fee Level:							
5 years: Change in Employment from:	PRIA (Current)	Modified PRIA	Proposed Action	Regional	FFFF	PRIA with Surchrg	Comp. Bid
5% Reduction in AUMS:	(710)	(710)	(710)	(710)	(710)	(710)	(710)
Increase in grazing fees:	0	(394)	(523)	(1,112)	(103)	(401)	(1,112)
Net Change in Employment:	(710)	(1,104)	(1,233)	(1,822)	(813)	(1,111)	(1,822)
Fee Level:							
5 Years: Change in Total Income from:	PRIA (Current)	Modified PRIA	Proposed Action	Regional	FFFF	PRIA with Surchrg	Comp. Bid
5% Reduction in AUMS (\$000):	(\$28,667)	(\$28,667)	(\$28,667)	(\$28,667)	(\$28,667)	(\$28,667)	(\$28,667)
Increase in Grazing Fees:	\$0	(\$14,596)	(\$19,393)	(\$41,216)	(\$3,796)	(\$14,841)	(\$41,216)
Net Change in Total Income (\$000):	(\$28,667)	(\$43,263)	(\$48,060)	(\$69,883)	(\$32,463)	(\$43,508)	(\$69,883)
Fee Level:							
20 Years: Change in Employment from:	PRIA (Current)	Modified PRIA	Proposed Action	Regional	FFFF	PRIA with Surchrg	Comp. Bid
20% Reduction in AUMS:	(2,643)	(2,643)	(2,643)	(2,643)	(2,643)	(2,643)	(2,643)
Increase in Grazing Fees:	0	(332)	(441)	(936)	(86)	(338)	(936)
Net Change in Employment:	(2,643)	(2,975)	(3,084)	(3,579)	(2,729)	(2,981)	(3,579)
Fee Level:							
20 Years: Change in Total Income from:	PRIA (Current)	Modified PRIA	Proposed Action	Regional	FFFF	PRIA with Surchrg	Comp. Bid
20% Reduction in AUMS:	(\$106,747)	(\$106,747)	(\$106,747)	(\$106,747)	(\$106,747)	(\$106,747)	(\$106,747)
Increase in Grazing Fees:	\$0	(\$12,291)	(\$16,331)	(\$34,708)	(\$3,196)	(\$12,498)	(\$34,708)
Net Change in Total Income (\$000)	(\$106,747)	(\$119,038)	(\$123,078)	(\$141,455)	(\$109,943)	(\$119,245)	(\$141,455)





**Table 2: Proposed Action**

Fee Level:							
5 Years: Change in Employment from:	PRIA (Current)	Modified PRIA	Proposed Action	Regional	FFFF	PRIA with Surchrg	Comp. Bid
12% Reduction in AUMS:	(1,682)	(1,682)	(1,682)	(1,682)	(1,682)	(1,682)	(1,682)
Increase in Grazing Fees:	0	(365)	(485)	(1,030)	(95)	(371)	(1,030)
Net Change in Employment:	(1,682)	(2,047)	(2,167)	(2,712)	(1,777)	(2,053)	(2,712)
Fee Level:							
5 Years: Change in Total Income from:	PRIA (Current)	Modified PRIA	Proposed Action	Regional	FFFF	PRIA with Surchrg	Comp. Bid
12% Reduction in AUMS (\$000):	(\$67,906)	(\$67,906)	(\$67,906)	(\$67,906)	(\$67,906)	(\$67,906)	(\$67,906)
Increase in Grazing Fees:	\$0	(\$13,521)	(\$17,964)	(\$38,179)	(\$3,516)	(\$13,747)	(\$38,179)
Net Change in Total Income (\$000)	(\$67,906)	(\$81,427)	(\$85,870)	(\$106,085)	(\$71,422)	(\$81,653)	(\$106,085)
Fee Level:							
20 Years: Change in Employment from:	PRIA (Current)	Modified PRIA	Proposed Action	Regional	FFFF	PRIA with Surchrg	Comp. Bid
21% Reduction in AUMS:	(2,760)	(2,760)	(2,760)	(2,760)	(2,760)	(2,760)	(2,760)
Increase in Grazing Fees:	0	(328)	(435)	(924)	(85)	(333)	(924)
Net Change in Employment:	(2,760)	(3,088)	(3,195)	(3,684)	(2,845)	(3,093)	(3,684)
Fee Level:							
20 Years: Change in Total Income from:	PRIA (Current)	Modified PRIA	Proposed Action	Regional	FFFF	PRIA with Surchrg	Comp. Bid
21% Reduction in AUMS:	(\$111,472)	(\$111,472)	(\$111,472)	(\$111,472)	(\$111,472)	(\$111,472)	(\$111,472)
Increase in Grazing Fees:	\$0	(\$12,138)	(\$16,127)	(\$34,274)	(\$3,156)	(\$12,341)	(\$34,274)
Net Change in Total Income (\$000):	(\$111,472)	(\$123,610)	(\$127,599)	(\$145,746)	(\$114,628)	(\$123,813)	(\$145,746)





**Table 3: Livestock Production**

Fee Level:							
5 Years: Change in Employment from:	PRIA (Current)	Modified PRIA	Proposed Action	Regional	FFFF	PRIA with Surchrg	Comp. Bid
3% Reduction in AUMS:	(471)	(471)	(471)	(471)	(471)	(471)	(471)
Increase in Grazing Fees:	0	(403)	(534)	(1,135)	(105)	(409)	(1,135)
Net Change in Employment:	(471)	(874)	(1,005)	(1,606)	(576)	(880)	(1,606)
Fee Level:							
5 Years: Change in Total Income from:	PRIA (Current)	Modified PRIA	Proposed Action	Regional	FFFF	PRIA with Surchrg	Comp. Bid
3% Reduction in AUMS (\$000):	(\$19,058)	(\$19,058)	(\$19,058)	(\$19,058)	(\$19,058)	(\$19,058)	(\$19,058)
Increase in Grazing Fees:	\$0	(\$14,903)	(\$19,802)	(\$42,084)	(\$3,876)	(\$15,153)	(\$42,084)
Net Change in Total Income (\$000):	(\$19,058)	(\$33,961)	(\$38,860)	(\$61,142)	(\$22,934)	(\$34,211)	(\$61,142)
Fee Level:							
20 Years: Change in Employment from:	PRIA (Current)	Modified PRIA	Proposed Action	Regional	FFFF	PRIA with Surchrg	Comp. Bid
12% Reduction in AUMS:	(1,697)	(1,697)	(1,697)	(1,697)	(1,697)	(1,697)	(1,697)
Increase in Grazing Fees:	0	(365)	(485)	(1,030)	(95)	(371)	(1,030)
Net Change in Employment:	(1,697)	(2,062)	(2,182)	(2,727)	(1,792)	(2,068)	(2,727)
Fee Level:							
20 Years: Change in Total Income from:	PRIA (Current)	Modified PRIA	Proposed Action	Regional	FFFF	PRIA with Surchrg	Comp. Bid
12% Reduction in AUMS:	(\$68,513)	(\$68,513)	(\$68,513)	(\$68,513)	(\$68,513)	(\$68,513)	(\$68,513)
Increase in Grazing Fees:	\$0	(\$13,521)	(\$17,964)	(\$38,179)	(\$3,516)	(\$13,747)	(\$38,179)
Net Change in Total Income (\$000):	(\$68,513)	(\$82,034)	(\$86,477)	(\$106,692)	(\$72,029)	(\$82,260)	(\$106,692)

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**Table 4: Environmental Enhancement**

Fee Level:							
5 Years: Change in Employment from:	PRIA (Current)	Modified PRIA	Proposed Action	Regional	FFFF	PRIA with Surchrg	Comp. Bid
50% Reduction in AUMS:	(7,239)	(7,239)	(7,239)	(7,239)	(7,239)	(7,239)	(7,239)
Increase in Grazing Fees:	0	(208)	(276)	(585)	(54)	(211)	(585)
Net Change in Employment:	(7,239)	(7,447)	(7,515)	(7,824)	(7,293)	(7,450)	(7,824)
Fee Level:							
5 Years: Change in Total Income from:	PRIA (Current)	Modified PRIA	Proposed Action	Regional	FFFF	PRIA with Surchrg	Comp. Bid
50% Reduction in AUMS (\$000):	(\$292,331)	(\$292,331)	(\$292,331)	(\$292,331)	(\$292,331)	(\$292,331)	(\$292,331)
Increase in Grazing Fees:	\$0	(\$7,682)	(\$10,207)	(\$21,693)	(\$1,998)	(\$7,811)	(\$21,693)
Net Change in Total Income (\$000):	(\$292,331)	(\$300,013)	(\$302,538)	(\$314,024)	(\$294,329)	(\$300,142)	(\$314,024)
Fee Level:							
20 Years: Change in Employment from:	PRIA (Current)	Modified PRIA	Proposed Action	Regional	FFFF	PRIA with Surchrg	Comp. Bid
31% Reduction in AUMS:	(4,388)	(4,388)	(4,388)	(4,388)	(4,388)	(4,388)	(4,388)
Increase in Grazing Fees:	0	(286)	(380)	(807)	(75)	(291)	(807)
Net Change in Employment:	(4,388)	(4,674)	(4,768)	(5,195)	(4,463)	(4,679)	(5,195)
Fee Level:							
20 Years: Change in Total Income from:	PRIA (Current)	Modified PRIA	Proposed Action	Regional	FFFF	PRIA with Surchrg	Comp. Bid
31% Reduction in AUMS:	(\$177,196)	(\$177,196)	(\$177,196)	(\$177,196)	(\$177,196)	(\$177,196)	(\$177,196)
Increase in Grazing Fees:	\$0	(\$10,601)	(\$14,086)	(\$29,936)	(\$2,757)	(\$10,779)	(\$29,936)
Net Change in Total Income (\$000):	(\$177,196)	(\$187,797)	(\$191,282)	(\$207,132)	(\$179,953)	(\$187,975)	(\$207,132)





**Table 5: Current Management**

Fee Level:							
	PRIA (Current)	Modified PRIA	Proposed Action	Regional	FFFF	PRIA with Surchrg	Competitive Bidding
Change in Employment:							
After 5 Years:	(710)	(1,104)	(1,233)	(1,822)	(813)	(1,111)	(1,822)
After 20 Years:	(2,643)	(2,975)	(3,084)	(3,579)	(2,729)	(2,981)	(3,579)
Change in Income (1993 \$):							
After 5 Years (\$000):	(\$28,667)	(\$43,263)	(\$48,060)	(\$69,883)	(\$32,463)	(\$43,508)	(\$69,883)
After 20 Years (\$000)	(\$106,747)	(\$119,038)	(\$123,078)	(\$141,455)	(\$109,943)	(\$119,245)	(\$141,455)

**Table 6: Proposed Action**

Fee Level:							
	PRIA (Current)	Modified PRIA	Proposed Action	Regional	FFFF	PRIA with Surchrg	Competitive Bidding
Change in Employment:							
After 5 Years:	(1,682)	(2,047)	(2,167)	(2,712)	(1,777)	(2,053)	(2,712)
After 20 Years:	(2,760)	(3,088)	(3,195)	(3,684)	(2,845)	(3,093)	(3,684)
Change in Income (1993 \$):							
After 5 Years (\$000):	(\$67,906)	(\$81,427)	(\$85,870)	(\$106,085)	(\$71,422)	(\$81,653)	(\$106,085)
After 20 Years (\$000)	(\$111,472)	(\$123,610)	(\$127,599)	(\$145,746)	(\$114,628)	(\$123,813)	(\$145,746)

**Table 7: Stewardship**

Fee Level:							
	PRIA (Current)	Modified PRIA	Proposed Action	Regional	FFFF	PRIA with Surchrg	Competitive Bidding
Change in Employment:							
After 5 Years:	(471)	(874)	(1,005)	(1,606)	(576)	(880)	(1,606)
After 20 Years:	(1,697)	(2,062)	(2,182)	(2,727)	(1,792)	(2,068)	(2,727)
Change in Income (1993 \$):							
After 5 Years (\$000):	(\$19,058)	(\$33,961)	(\$38,860)	(\$61,142)	(\$22,934)	(\$34,211)	(\$61,142)
After 20 Years (\$000)	(\$68,513)	(\$82,034)	(\$86,477)	(\$106,692)	(\$72,029)	(\$82,260)	(\$106,692)





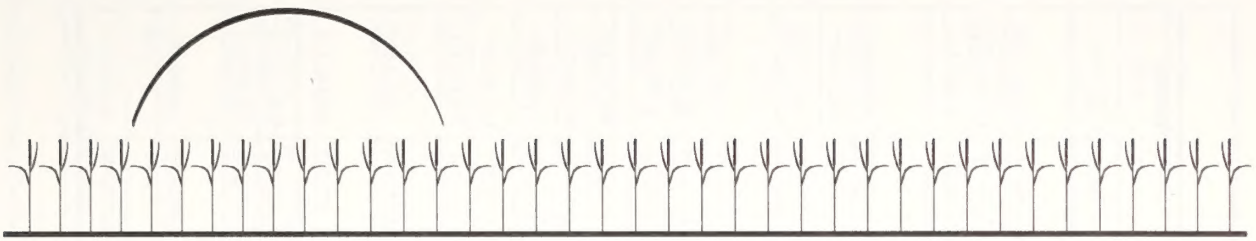
**Table 8: Suitability**

Fee Level:							
	PRIA (Current)	Modified PRIA	Proposed Action	Regional	FFFF	PRIA with Surchrg	Competitive Bidding
Change in Employment:							
After 5 Years:	(7,239)	(7,447)	(7,515)	(7,824)	(7,293)	(7,450)	(7,824)
After 20 Years:	(4,388)	(4,674)	(4,768)	(5,195)	(4,463)	(4,679)	(5,195)
Change in Income (1993 \$):							
After 5 Years (\$000):	(\$292,331)	(\$300,013)	(\$302,538)	(\$314,024)	(\$294,329)	(\$300,142)	(\$314,024)
After 20 Years (\$000)	(\$177,196)	(\$187,797)	(\$191,282)	(\$207,132)	(\$179,953)	(\$187,975)	(\$207,132)









## APPENDIX Q

### **Total Grazing Fee Receipts After 5 Years and 20 Years Under Different Fee Alternatives (1993 \$)**



Table 1: Current Management

	Current PRIA Fee		Modified PRIA Fee		Proposed Action Fee		Regional Fees and Competitive Bidding		Federal Forage Fee		PRIA with Surcharge		
	Current	5 Years	20 Years	5 Years	20 Years	5 Years	20 Years	5 Years	20 Years	5 Years	20 Years	5 Years	20 Years
Range Betterment Fund (RBF)	\$15,389,109	\$14,619,654	\$12,311,287	\$29,005,394	\$24,425,594	\$33,639,824	\$28,328,272	\$50,145,413	\$42,227,715	\$18,552,341	\$15,623,023	\$29,239,308	\$24,622,574
BLM	\$9,465,499	\$8,992,224	\$7,572,399	\$17,840,572	\$15,023,640	\$20,691,107	\$17,424,091	\$30,843,328	\$25,973,329	\$11,411,132	\$9,609,375	\$17,984,448	\$15,144,798
USFS	\$5,923,610	\$5,627,430	\$4,738,888	\$11,164,821	\$9,401,954	\$12,948,716	\$10,904,181	\$19,302,085	\$16,254,386	\$7,141,209	\$6,013,649	\$11,254,860	\$9,477,776
Payments States/Countries	\$5,996,516	\$5,696,690	\$4,797,213	\$11,302,233	\$9,517,670	\$13,108,084	\$11,038,387	\$19,539,647	\$16,454,440	\$7,229,100	\$6,087,663	\$11,393,380	\$9,594,426
BLM	\$3,321,668	\$3,155,584	\$2,657,334	\$6,260,679	\$5,272,151	\$7,260,999	\$6,114,526	\$10,823,653	\$9,114,657	\$4,004,436	\$3,372,157	\$6,311,168	\$5,314,669
USFS	\$2,674,848	\$2,541,106	\$2,139,878	\$5,041,554	\$4,245,519	\$5,847,085	\$4,923,860	\$8,715,994	\$7,339,783	\$3,224,664	\$2,715,506	\$5,082,212	\$4,279,757
Receipts to Fed Treasury	\$9,392,593	\$8,922,964	\$7,514,074	\$17,703,161	\$14,907,924	\$20,531,740	\$17,289,885	\$30,605,767	\$25,773,275	\$11,323,241	\$9,535,360	\$17,845,928	\$15,028,149
BLM	\$6,143,831	\$5,836,640	\$4,915,065	\$11,579,894	\$9,751,489	\$13,430,109	\$11,309,564	\$20,019,675	\$16,858,672	\$7,406,696	\$6,237,217	\$11,673,280	\$9,830,130
USFS	\$3,248,762	\$3,086,324	\$2,599,010	\$6,123,267	\$5,156,435	\$7,101,632	\$5,980,321	\$10,586,091	\$8,914,603	\$3,916,545	\$3,298,143	\$6,172,648	\$5,198,019
Total	\$30,778,218	\$29,239,308	\$24,622,574	\$58,010,787	\$48,851,188	\$67,279,648	\$56,656,544	\$100,290,826	\$84,455,430	\$37,104,682	\$31,246,047	\$58,478,616	\$49,245,149
BLM	\$18,930,998	\$17,984,448	\$15,144,798	\$35,681,145	\$30,047,280	\$41,382,215	\$34,848,181	\$61,686,657	\$51,946,659	\$22,822,265	\$19,218,749	\$35,968,896	\$30,289,597
USFS	\$11,847,220	\$11,254,860	\$9,477,776	\$22,329,642	\$18,803,908	\$25,897,433	\$21,808,363	\$38,604,170	\$32,508,772	\$14,282,417	\$12,027,298	\$22,509,720	\$18,955,552
BLM	\$18,930,998	\$17,984,448	\$15,144,798	\$35,681,145	\$30,047,280	\$41,382,215	\$34,848,181	\$61,686,657	\$51,946,659	\$22,822,265	\$19,218,749	\$35,968,896	\$30,289,597
RBF	\$9,465,499	\$8,992,224	\$7,572,399	\$17,840,572	\$15,023,640	\$20,691,107	\$17,424,091	\$30,843,328	\$25,973,329	\$11,411,132	\$9,609,375	\$17,984,448	\$15,144,798
Payments States/Countries	\$3,321,668	\$3,155,584	\$2,657,334	\$6,260,679	\$5,272,151	\$7,260,999	\$6,114,526	\$10,823,653	\$9,114,657	\$4,004,436	\$3,372,157	\$6,311,168	\$5,314,669
Receipts to Fed Treasury	\$6,143,831	\$5,836,640	\$4,915,065	\$11,579,894	\$9,751,489	\$13,430,109	\$11,309,564	\$20,019,675	\$16,858,672	\$7,406,696	\$6,237,217	\$11,673,280	\$9,830,130
USFS	\$11,847,220	\$11,254,860	\$9,477,776	\$22,329,642	\$18,803,908	\$25,897,433	\$21,808,363	\$38,604,170	\$32,508,772	\$14,282,417	\$12,027,298	\$22,509,720	\$18,955,552
RBF	\$5,923,610	\$5,627,430	\$4,738,888	\$11,164,821	\$9,401,954	\$12,948,716	\$10,904,181	\$19,302,085	\$16,254,386	\$7,141,209	\$6,013,649	\$11,254,860	\$9,477,776
Payments States/Countries	\$2,674,848	\$2,541,106	\$2,139,878	\$5,041,554	\$4,245,519	\$5,847,085	\$4,923,860	\$8,715,994	\$7,339,783	\$3,224,664	\$2,715,506	\$5,082,212	\$4,279,757
Receipts to Fed Treasury	\$3,248,762	\$3,086,324	\$2,599,010	\$6,123,267	\$5,156,435	\$7,101,632	\$5,980,321	\$10,586,091	\$8,914,603	\$3,916,545	\$3,298,143	\$6,172,648	\$5,198,019



**Table 2: Proposed Action**

	Current PRIA Fee						Modified PRIA Fee						Proposed Action Fee						Regional Fees and Competitive Bidding						Federal Forage Fee						PRIA with Surcharge					
	Current			5 Years			20 Years			5 Years			20 Years			5 Years			20 Years			5 Years			20 Years			5 Years			20 Years					
	Current	5 Years	20 Years	5 Years	20 Years	20 Years	5 Years	20 Years	20 Years	5 Years	20 Years	20 Years	5 Years	20 Years	20 Years	5 Years	20 Years	20 Years	5 Years	20 Years	20 Years	5 Years	20 Years	20 Years	5 Years	20 Years	20 Years	5 Years	20 Years							
Range Betterment Fund (RBF)	\$15,389,109	\$13,542,416	\$12,157,396	\$26,868,153	\$24,120,274	\$31,161,099	\$27,974,168	\$46,450,487	\$41,699,869	\$17,185,326	\$15,427,736	\$17,185,326	\$17,185,326	\$17,185,326	\$17,185,326	\$17,185,326	\$17,185,326	\$17,185,326	\$17,185,326	\$17,185,326	\$17,185,326	\$17,185,326	\$17,185,326	\$17,185,326	\$17,185,326	\$17,185,326	\$17,185,326	\$17,185,326	\$17,185,326	\$17,185,326						
BLM	\$9,465,499	\$8,329,639	\$7,477,744	\$14,835,845	\$14,835,845	\$19,166,499	\$17,206,289	\$28,570,662	\$25,648,663	\$10,570,312	\$9,489,257	\$10,570,312	\$10,570,312	\$10,570,312	\$10,570,312	\$10,570,312	\$10,570,312	\$10,570,312	\$10,570,312	\$10,570,312	\$10,570,312	\$10,570,312	\$10,570,312	\$10,570,312	\$10,570,312	\$10,570,312	\$10,570,312	\$10,570,312	\$10,570,312							
USFS	\$5,923,610	\$5,212,777	\$4,679,652	\$10,342,150	\$9,284,429	\$11,994,600	\$10,767,879	\$17,879,825	\$16,051,206	\$6,615,014	\$5,938,478	\$6,615,014	\$6,615,014	\$6,615,014	\$6,615,014	\$6,615,014	\$6,615,014	\$6,615,014	\$6,615,014	\$6,615,014	\$6,615,014	\$6,615,014	\$6,615,014	\$6,615,014	\$6,615,014	\$6,615,014	\$6,615,014	\$6,615,014	\$6,615,014							
Payments States/Countries	\$5,996,516	\$5,276,934	\$4,737,248	\$10,469,437	\$9,398,699	\$12,142,225	\$10,900,407	\$18,099,884	\$16,248,759	\$6,696,429	\$6,011,567	\$6,696,429	\$6,696,429	\$6,696,429	\$6,696,429	\$6,696,429	\$6,696,429	\$6,696,429	\$6,696,429	\$6,696,429	\$6,696,429	\$6,696,429	\$6,696,429	\$6,696,429	\$6,696,429	\$6,696,429	\$6,696,429	\$6,696,429	\$6,696,429							
BLM	\$3,321,668	\$2,923,068	\$2,624,118	\$5,799,367	\$5,206,250	\$6,725,979	\$6,038,095	\$10,026,123	\$9,000,724	\$3,709,373	\$3,330,005	\$3,709,373	\$3,709,373	\$3,709,373	\$3,709,373	\$3,709,373	\$3,709,373	\$3,709,373	\$3,709,373	\$3,709,373	\$3,709,373	\$3,709,373	\$3,709,373	\$3,709,373	\$3,709,373	\$3,709,373	\$3,709,373	\$3,709,373	\$3,709,373							
USFS	\$2,674,848	\$2,353,866	\$2,113,130	\$4,670,070	\$4,192,450	\$5,416,246	\$4,862,312	\$8,073,760	\$7,248,036	\$2,987,056	\$2,681,562	\$2,987,056	\$2,987,056	\$2,987,056	\$2,987,056	\$2,987,056	\$2,987,056	\$2,987,056	\$2,987,056	\$2,987,056	\$2,987,056	\$2,987,056	\$2,987,056	\$2,987,056	\$2,987,056	\$2,987,056	\$2,987,056	\$2,987,056	\$2,987,056							
Receipts to Fed Treasury	\$9,392,593	\$8,265,483	\$7,420,148	\$16,398,718	\$14,721,575	\$19,018,876	\$17,073,762	\$28,350,607	\$25,451,109	\$10,488,898	\$9,416,168	\$10,488,898	\$10,488,898	\$10,488,898	\$10,488,898	\$10,488,898	\$10,488,898	\$10,488,898	\$10,488,898	\$10,488,898	\$10,488,898	\$10,488,898	\$10,488,898	\$10,488,898	\$10,488,898	\$10,488,898	\$10,488,898	\$10,488,898	\$10,488,898							
BLM	\$6,143,831	\$5,406,572	\$4,853,626	\$10,726,639	\$9,629,595	\$12,440,522	\$11,168,195	\$18,544,542	\$16,647,939	\$6,860,940	\$6,159,252	\$6,860,940	\$6,860,940	\$6,860,940	\$6,860,940	\$6,860,940	\$6,860,940	\$6,860,940	\$6,860,940	\$6,860,940	\$6,860,940	\$6,860,940	\$6,860,940	\$6,860,940	\$6,860,940	\$6,860,940	\$6,860,940	\$6,860,940	\$6,860,940							
USFS	\$3,248,762	\$2,858,911	\$2,566,522	\$5,672,079	\$5,091,980	\$6,578,354	\$5,905,567	\$9,806,065	\$8,803,170	\$3,627,958	\$3,256,916	\$3,627,958	\$3,627,958	\$3,627,958	\$3,627,958	\$3,627,958	\$3,627,958	\$3,627,958	\$3,627,958	\$3,627,958	\$3,627,958	\$3,627,958	\$3,627,958	\$3,627,958	\$3,627,958	\$3,627,958	\$3,627,958	\$3,627,958	\$3,627,958							
Total	\$30,778,218	\$27,084,833	\$24,314,792	\$53,736,309	\$48,240,548	\$62,322,201	\$55,948,337	\$92,900,977	\$83,399,737	\$34,370,653	\$30,855,471	\$34,370,653	\$34,370,653	\$34,370,653	\$34,370,653	\$34,370,653	\$34,370,653	\$34,370,653	\$34,370,653	\$34,370,653	\$34,370,653	\$34,370,653	\$34,370,653	\$34,370,653	\$34,370,653	\$34,370,653	\$34,370,653	\$34,370,653	\$34,370,653							
BLM	\$18,930,998	\$16,659,279	\$14,955,488	\$33,052,010	\$29,671,689	\$38,333,001	\$34,412,579	\$57,141,327	\$51,297,325	\$21,140,625	\$18,978,515	\$21,140,625	\$21,140,625	\$21,140,625	\$21,140,625	\$21,140,625	\$21,140,625	\$21,140,625	\$21,140,625	\$21,140,625	\$21,140,625	\$21,140,625	\$21,140,625	\$21,140,625	\$21,140,625	\$21,140,625	\$21,140,625	\$21,140,625	\$21,140,625							
USFS	\$11,847,220	\$10,425,554	\$9,359,304	\$20,684,299	\$18,568,859	\$23,989,200	\$21,535,758	\$35,759,650	\$32,102,412	\$13,230,028	\$11,876,957	\$13,230,028	\$13,230,028	\$13,230,028	\$13,230,028	\$13,230,028	\$13,230,028	\$13,230,028	\$13,230,028	\$13,230,028	\$13,230,028	\$13,230,028	\$13,230,028	\$13,230,028	\$13,230,028	\$13,230,028	\$13,230,028	\$13,230,028	\$13,230,028							
BLM	\$18,930,998	\$16,659,279	\$14,955,488	\$33,052,010	\$29,671,689	\$38,333,001	\$34,412,579	\$57,141,327	\$51,297,325	\$21,140,625	\$18,978,515	\$21,140,625	\$21,140,625	\$21,140,625	\$21,140,625	\$21,140,625	\$21,140,625	\$21,140,625	\$21,140,625	\$21,140,625	\$21,140,625	\$21,140,625	\$21,140,625	\$21,140,625	\$21,140,625	\$21,140,625	\$21,140,625	\$21,140,625	\$21,140,625							
RBF	\$9,465,499	\$8,329,639	\$7,477,744	\$16,526,004	\$14,835,845	\$19,166,499	\$17,206,289	\$28,570,662	\$25,648,663	\$10,570,312	\$9,489,257	\$10,570,312	\$10,570,312	\$10,570,312	\$10,570,312	\$10,570,312	\$10,570,312	\$10,570,312	\$10,570,312	\$10,570,312	\$10,570,312	\$10,570,312	\$10,570,312	\$10,570,312	\$10,570,312	\$10,570,312	\$10,570,312	\$10,570,312	\$10,570,312							
Payments States/Countries	\$3,321,668	\$2,923,068	\$2,624,118	\$5,799,367	\$5,206,250	\$6,725,979	\$6,038,095	\$10,026,123	\$9,000,724	\$3,709,373	\$3,330,005	\$3,709,373	\$3,709,373	\$3,709,373	\$3,709,373	\$3,709,373	\$3,709,373	\$3,709,373	\$3,709,373	\$3,709,373	\$3,709,373	\$3,709,373	\$3,709,373	\$3,709,373	\$3,709,373	\$3,709,373	\$3,709,373	\$3,709,373	\$3,709,373							
Receipts to Fed Treasury	\$6,143,831	\$5,406,572	\$4,853,626	\$10,726,639	\$9,629,595	\$12,440,522	\$11,168,195	\$18,544,542	\$16,647,939	\$6,860,940	\$6,159,252	\$6,860,940	\$6,860,940	\$6,860,940	\$6,860,940	\$6,860,940	\$6,860,940	\$6,860,940	\$6,860,940	\$6,860,940	\$6,860,940	\$6,860,940	\$6,860,940	\$6,860,940	\$6,860,940	\$6,860,940	\$6,860,940	\$6,860,940	\$6,860,940							
USFS	\$11,847,220	\$10,425,554	\$9,359,304	\$20,684,299	\$18,568,859	\$23,989,200	\$21,535,758	\$35,759,650	\$32,102,412	\$13,230,028	\$11,876,957	\$13,230,028	\$13,230,028	\$13,230,028	\$13,230,028	\$13,230,028	\$13,230,028	\$13,230,028	\$13,230,028	\$13,230,028	\$13,230,028	\$13,230,028	\$13,230,028	\$13,230,028	\$13,230,028	\$13,230,028	\$13,230,028	\$13,230,028	\$13,230,028							
RBF	\$5,923,610	\$5,212,777	\$4,679,652	\$10,342,150	\$9,284,429	\$11,994,600	\$10,767,879	\$17,879,825	\$16,051,206	\$6,615,014	\$5,938,478	\$6,615,014	\$6,615,014	\$6,615,014	\$6,615,014	\$6,615,014	\$6,615,014	\$6,615,014	\$6,615,014	\$6,615,014	\$6,615,014	\$6,615,014	\$6,615,014	\$6,615,014	\$6,615,014	\$6,615,014	\$6,615,014	\$6,615,014	\$6,615,014							
Payments States/Countries	\$2,674,848	\$2,353,866	\$2,113,130	\$4,670,070	\$4,192,450	\$5,416,246	\$4,862,312	\$8,073,760	\$7,248,036	\$2,987,056	\$2,681,562	\$2,987,056	\$2,987,056	\$2,987,056	\$2,987,056	\$2,987,056	\$2,987,056	\$2,987,056	\$2,987,056	\$2,987,056	\$2,987,056	\$2,987,056	\$2,987,056	\$2,987,056	\$2,987,056	\$2,987,056	\$2,987,056	\$2,987,056	\$2,987,056							
Receipts to Fed Treasury	\$3,248,762	\$2,858,911	\$2,566,522	\$5,672,079	\$5,091,980	\$6,578,354	\$5,905,567	\$9,806,065	\$8,803,170	\$3,627,958	\$3,256,916	\$3,627,958	\$3,627,958	\$3,627,958	\$3,627,958	\$3,627,958	\$3,627,958	\$3,627,958	\$3,627,958	\$3,627,958	\$3,627,958	\$3,627,958	\$3,627,958	\$3,627,958	\$3,627,958	\$3,627,958	\$3,627,958	\$3,627,958	\$3,627,958							



**Table 3: Livestock Production**

	Current PRIA Fee		Modified PRIA Fee		Proposed Action Fee		Regional Fees and Competitive Bidding		Federal Forage Fee		PRIA with Surcharge		
	Current	5 Years	20 Years	5 Years	20 Years	5 Years	20 Years	5 Years	20 Years	5 Years	20 Years	5 Years	20 Years
Range Betterment Fund (RBF)	\$15,389,109	\$14,927,436	\$13,542,416	\$29,616,033	\$26,868,153	\$34,348,030	\$31,161,099	\$51,201,105	\$46,450,487	\$17,185,326	\$18,942,916	\$29,854,872	\$27,084,832
BLM	\$9,465,499	\$9,181,534	\$8,329,639	\$18,216,163	\$16,526,004	\$21,126,710	\$19,166,499	\$31,492,662	\$28,570,662	\$10,570,312	\$11,651,367	\$18,363,068	\$16,659,278
USFS	\$5,923,610	\$5,745,902	\$5,212,777	\$11,399,870	\$10,342,150	\$13,221,321	\$11,994,600	\$19,708,444	\$17,879,825	\$6,615,014	\$7,291,550	\$11,491,804	\$10,425,554
Payments States/Countries	\$5,996,516	\$5,816,621	\$5,276,934	\$11,540,176	\$10,469,437	\$13,384,045	\$12,142,225	\$19,951,010	\$18,099,884	\$6,696,429	\$7,381,292	\$11,633,242	\$10,553,868
BLM	\$3,321,668	\$3,222,018	\$2,923,068	\$6,392,484	\$5,799,367	\$7,413,863	\$6,725,979	\$11,051,522	\$10,026,123	\$3,709,373	\$4,088,741	\$6,444,036	\$5,846,136
USFS	\$2,674,848	\$2,594,603	\$2,353,866	\$5,147,692	\$4,670,070	\$5,970,182	\$5,416,246	\$8,899,488	\$8,073,760	\$2,987,056	\$3,292,551	\$5,189,206	\$4,707,732
Receipts to Fed Treasury	\$9,392,593	\$9,110,815	\$8,265,483	\$18,075,857	\$16,398,718	\$20,963,985	\$19,018,876	\$31,250,095	\$28,350,607	\$10,488,898	\$11,561,624	\$18,221,630	\$16,530,966
BLM	\$6,143,831	\$5,959,516	\$5,406,572	\$11,823,680	\$10,726,639	\$13,712,846	\$12,440,522	\$20,441,140	\$18,544,542	\$6,860,940	\$7,562,626	\$11,919,032	\$10,813,144
USFS	\$3,248,762	\$3,151,299	\$2,858,911	\$6,252,177	\$5,672,079	\$7,251,139	\$6,578,354	\$10,808,956	\$9,806,065	\$3,627,958	\$3,998,998	\$6,302,598	\$5,717,822
Total	\$30,778,218	\$29,854,872	\$27,084,833	\$59,232,066	\$53,736,309	\$68,696,060	\$62,322,201	\$102,402,211	\$92,900,977	\$34,370,653	\$37,885,833	\$59,709,744	\$54,169,666
BLM	\$18,930,998	\$18,363,068	\$16,659,279	\$36,432,327	\$33,052,010	\$42,253,419	\$38,333,001	\$62,985,323	\$57,141,327	\$21,140,625	\$23,302,733	\$36,726,136	\$33,318,558
USFS	\$11,847,220	\$11,491,804	\$10,425,554	\$22,799,739	\$20,684,299	\$26,442,641	\$23,989,200	\$39,416,888	\$35,759,650	\$13,230,028	\$14,583,099	\$22,983,608	\$20,851,108
BLM	\$18,930,998	\$18,363,068	\$16,659,279	\$36,432,327	\$33,052,010	\$42,253,419	\$38,333,001	\$62,985,323	\$57,141,327	\$21,140,625	\$23,302,733	\$36,726,136	\$33,318,558
RBF	\$9,465,499	\$9,181,534	\$8,329,639	\$18,216,163	\$16,526,004	\$21,126,710	\$19,166,499	\$31,492,662	\$28,570,662	\$10,570,312	\$11,651,367	\$18,363,068	\$16,659,278
Payments States/Countries	\$3,321,668	\$3,222,018	\$2,923,068	\$6,392,484	\$5,799,367	\$7,413,863	\$6,725,979	\$11,051,522	\$10,026,123	\$3,709,373	\$4,088,741	\$6,444,036	\$5,846,136
Receipts to Fed Treasury	\$6,143,831	\$5,959,516	\$5,406,572	\$11,823,680	\$10,726,639	\$13,712,846	\$12,440,522	\$20,441,140	\$18,544,542	\$6,860,940	\$7,562,626	\$11,919,032	\$10,813,144
USFS	\$11,847,220	\$11,491,804	\$10,425,554	\$22,799,739	\$20,684,299	\$26,442,641	\$23,989,200	\$39,416,888	\$35,759,650	\$13,230,028	\$14,583,099	\$22,983,608	\$20,851,108
RBF	\$5,923,610	\$5,745,902	\$5,212,777	\$11,399,870	\$10,342,150	\$13,221,321	\$11,994,600	\$19,708,444	\$17,879,825	\$6,615,014	\$7,291,550	\$11,491,804	\$10,425,554
Payments States/Countries	\$2,674,848	\$2,594,603	\$2,353,866	\$5,147,692	\$4,670,070	\$5,970,182	\$5,416,246	\$8,899,488	\$8,073,760	\$2,987,056	\$3,292,551	\$5,189,206	\$4,707,732
Receipts to Fed Treasury	\$3,248,762	\$3,151,299	\$2,858,911	\$6,252,177	\$5,672,079	\$7,251,139	\$6,578,354	\$10,808,956	\$9,806,065	\$3,627,958	\$3,998,998	\$6,302,598	\$5,717,822



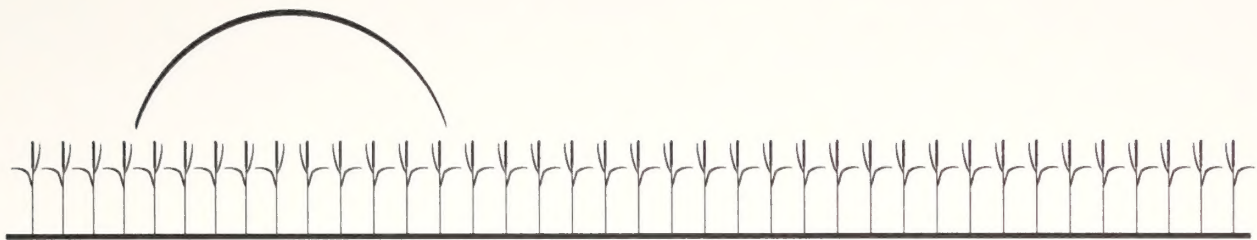
**Table 4: Environmental Enhancement**

	Current PRIA Fee		Modified PRIA Fee		Proposed Action Fee		Regional Fees and Competitive Bidding		Federal Forage Fee		PRIA with Surcharge		
	Current	5 Years	20 Years	5 Years	20 Years	5 Years	20 Years	5 Years	20 Years	5 Years	20 Years	5 Years	20 Years
	Range Betterment Fund (RBF)	\$15,389,109	\$7,694,555	\$10,772,376	\$15,265,997	\$21,372,394	\$17,705,171	\$24,787,237	\$26,392,324	\$36,949,250	\$9,764,390	\$13,670,145	\$15,389,110
BLM	\$9,465,499	\$4,732,750	\$6,625,849	\$9,389,776	\$13,145,684	\$10,890,058	\$15,246,079	\$16,233,333	\$22,726,662	\$6,005,860	\$8,408,202	\$9,465,500	\$13,251,698
USFS	\$5,923,610	\$2,961,805	\$4,146,527	\$5,876,221	\$8,226,710	\$6,815,113	\$9,541,159	\$10,158,991	\$14,222,588	\$3,758,531	\$5,261,943	\$5,923,610	\$8,293,054
Payments States/Countries	\$5,996,516	\$2,998,258	\$4,197,561	\$5,948,544	\$8,327,961	\$6,898,992	\$9,658,588	\$10,284,025	\$14,397,634	\$3,804,789	\$5,326,705	\$5,996,516	\$8,395,122
BLM	\$3,321,668	\$1,660,834	\$2,325,167	\$3,295,095	\$4,613,131	\$3,821,579	\$5,350,209	\$5,696,661	\$7,975,323	\$2,107,598	\$2,950,637	\$3,321,668	\$4,650,334
USFS	\$2,674,848	\$1,337,424	\$1,872,394	\$2,653,449	\$3,714,830	\$3,077,413	\$4,308,379	\$4,587,364	\$6,422,311	\$1,697,191	\$2,376,068	\$2,674,848	\$3,744,788
Receipts to Fed Treasury	\$9,392,593	\$4,696,297	\$6,574,816	\$9,317,453	\$13,044,435	\$10,806,179	\$15,128,652	\$16,108,299	\$22,551,619	\$5,959,601	\$8,343,442	\$9,392,594	\$13,149,632
BLM	\$6,143,831	\$3,071,916	\$4,300,682	\$6,094,681	\$8,532,553	\$7,068,479	\$9,895,869	\$10,536,672	\$14,751,339	\$3,898,261	\$5,457,565	\$6,143,832	\$8,601,364
USFS	\$3,248,762	\$1,624,381	\$2,274,134	\$3,222,772	\$4,511,882	\$3,737,701	\$5,232,782	\$5,571,627	\$7,800,280	\$2,061,339	\$2,885,876	\$3,248,762	\$4,548,268
Total	\$30,778,218	\$15,389,110	\$21,544,753	\$30,531,994	\$42,744,790	\$35,410,342	\$49,574,477	\$52,784,647	\$73,898,503	\$19,528,781	\$27,340,292	\$30,778,220	\$43,089,506
BLM	\$18,930,998	\$9,465,500	\$13,251,698	\$18,779,552	\$26,291,369	\$21,780,116	\$30,492,157	\$32,466,665	\$45,453,324	\$12,011,720	\$16,816,405	\$18,931,000	\$26,503,396
USFS	\$11,847,220	\$5,923,610	\$8,293,055	\$11,752,442	\$16,453,421	\$13,630,227	\$19,082,320	\$20,317,982	\$28,445,179	\$7,517,061	\$10,523,887	\$11,847,220	\$16,586,110
BLM	\$18,930,998	\$9,465,500	\$13,251,698	\$18,779,552	\$26,291,369	\$21,780,116	\$30,492,157	\$32,466,665	\$45,453,324	\$12,011,720	\$16,816,405	\$18,931,000	\$26,503,396
RBF	\$9,465,499	\$4,732,750	\$6,625,849	\$9,389,776	\$13,145,684	\$10,890,058	\$15,246,079	\$16,233,333	\$22,726,662	\$6,005,860	\$8,408,202	\$9,465,500	\$13,251,698
Payments States/Countries	\$3,321,668	\$1,660,834	\$2,325,167	\$3,295,095	\$4,613,131	\$3,821,579	\$5,350,209	\$5,696,661	\$7,975,323	\$2,107,598	\$2,950,637	\$3,321,668	\$4,650,334
Receipts to Fed Treasury	\$6,143,831	\$3,071,916	\$4,300,682	\$6,094,681	\$8,532,553	\$7,068,479	\$9,895,869	\$10,536,672	\$14,751,339	\$3,898,261	\$5,457,565	\$6,143,832	\$8,601,364
USFS	\$11,847,220	\$5,923,610	\$8,293,055	\$11,752,442	\$16,453,421	\$13,630,227	\$19,082,320	\$20,317,982	\$28,445,179	\$7,517,061	\$10,523,887	\$11,847,220	\$16,586,110
RBF	\$5,923,610	\$2,961,805	\$4,146,527	\$5,876,221	\$8,226,710	\$6,815,113	\$9,541,159	\$10,158,991	\$14,222,588	\$3,758,531	\$5,261,943	\$5,923,610	\$8,293,054
Payments States/Countries	\$2,674,848	\$1,337,424	\$1,872,394	\$2,653,449	\$3,714,830	\$3,077,413	\$4,308,379	\$4,587,364	\$6,422,311	\$1,697,191	\$2,376,068	\$2,674,848	\$3,744,788
Receipts to Fed Treasury	\$3,248,762	\$1,624,381	\$2,274,134	\$3,222,772	\$4,511,882	\$3,737,701	\$5,232,782	\$5,571,627	\$7,800,280	\$2,061,339	\$2,885,876	\$3,248,762	\$4,548,268









# APPENDIX R

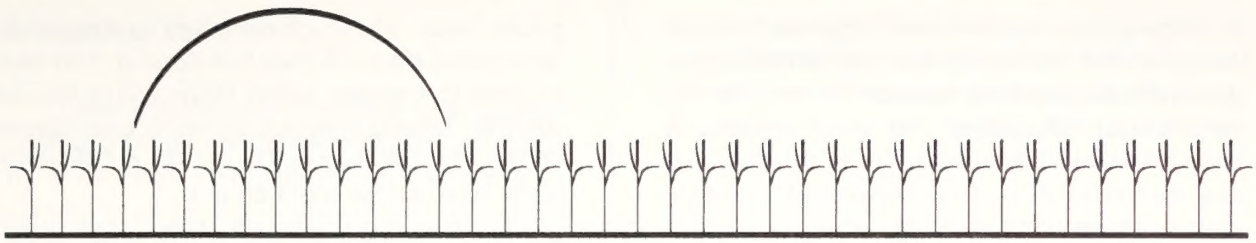
## U.S. Cattle Inventory (000's) January 1, 1993

State	All Cattle	Milk Cows	Milk Heifers	Cattle on Feed	Derived Beef Cattle	Derived Range Cattle
AZ	890	96	20	233	774	541
CA	4500	1170	560	440	2770	2330
CO	2850	80	40	1000	2730	1730
ID	1680	185	100	280	1395	1115
MT	2450	23	8	75	2419	2344
NV	480	20	6	40	454	414
NM	1370	123	26	130	1221	1091
OR	1350	101	40	100	1209	1109
UT	850	83	50	58	717	659
WA	1350	251	110	186	989	803
WY	1350	7	1	90	1342	1252
<b>Region</b>	19120	2139	961	2632	16020	13388
KS	5890	85	40	1920	5765	3845
NE	5900	97	35	2130	5768	3638
ND	1800	75	25	70	1700	1630
OK	5400	95	35	345	5270	4925
SD	3750	128	35	340	3587	3247
<b>Region</b>	22740	480	170	4805	22090	17285
TX	14300	380	100	2460	13820	11360
East Reg	44546.1	6833.3	2988.8	2800	34724	31924
AK	7.9	0.7	0.2		7	7
HI	178	11	4	2	163	161
48 State	100706.1	9832.2	4219.8	12697	86654	73957
U.S.	100892	9844	4224	12699	86824	74125
As revised 2/5/93. Source: USDA, NASS, 1993a.						









## APPENDIX S

# Summary of 1993 Grazing Town Hall Meetings

*In April, May, and July 1993, the Secretary of the Interior, Bruce Babbitt, conducted the following public meetings in the West to obtain public views on the rangeland management program:*

<i>April 30</i>	<i>Bozeman, MT</i>
<i>May 1</i>	<i>Reno, NV</i>
<i>May 5</i>	<i>Grand Junction, CO</i>
<i>May 6</i>	<i>Albuquerque, NM</i>
<i>July 9</i>	<i>Flagstaff, AZ</i>

*The Department of the Interior's Assistant Secretary for Land and Minerals Management, Bob Armstrong, attended all the meetings with Secretary Babbitt. There were also one or more Forest Service representatives at all the meetings. Jim Lyons, the Department of Agriculture's Assistant Secretary for Natural Resources and Environment, attended the Grand Junction and Albuquerque meetings; then-Forest Service Chief Dale Robertson attended the Bozeman, Reno, and Flagstaff meetings. BLM Director Jim Baca attended the Flagstaff meeting. In each town, Secretary Babbitt was also joined by other elected officials, grazing management and range economics experts, representatives of environmental groups and citizens' groups, and ranchers.*



The purpose of the meetings was to assist Secretary Babbitt in the development of a program of rangeland management reform for the public lands. Emphasis was on restoration of public lands and improving stewardship. Grazing fee increases were also discussed at length. The locations of the meetings were designed to be accessible to the ranching communities.

Although these meetings were not part of the formal scoping process, the BLM and the Forest Service considered the views expressed at these meetings during development of the rangeland reform initiative and the Rangeland Reform '94 Draft EIS.

## *Panels and Testimony*

At the first four meetings, elected officials spoke first, followed by a panel on range and resource economics and then a panel on management and stewardship. The Flagstaff meeting included a panel presentation on grazing policy and environmental management objectives, and comments from elected officials and panel members. Panelists for all five meetings were chosen to represent a diversity of viewpoints and approaches to the problems of grazing on the public lands. (A list of panel members for all five meetings may be found at the end of this appendix.)

After each panel, the public was invited to make statements to the Secretary and the expert panelists. This amounted to over 3 hours of testimony at each of the meetings by a total of more than 300 members of the public. The grazing fee was the major topic of comment.

Participants identifying themselves as aligned with the grazing industry far outnumbered those who were neutral or opposed to grazing. Therefore, far more comments opposed a grazing fee increase than favored one. However, many people were willing to discuss moderate fee increases. Only a small number of people attacked the concept of grazing as a legitimate use of the public lands. A number of participants mentioned incentive-based grazing fees or biodiversity-driven management systems.

Many livestock operators made the point that the federal grazing fee cannot be compared to private land lease rates because it does not reflect the real cost to graze livestock on the

public lands. Livestock operators also regularly mentioned the work they had done at their own expense to improve public lands and to benefit wildlife. Several livestock operators commented on the fact that they pay to use the public lands while recreational users do not.

Most of those who identified themselves with environmental groups emphasized the condition of the land as the most important objective, more important than protecting the taxpayer with a market-based fee approach. In fact, numerous commenters on both sides of the grazing fee question said that the fee is not the issue. Most agreed that grazing decisions should be based on science, not emotion. Virtually all who favored increases in the grazing fee wanted to see the increased revenues put back into the land.

Many speakers pointed out that the fabric of western rural economies is tied to the traditional concept of grazing on the public lands. The effect of increased fees on the local economies was mentioned regularly. Some pro-grazing commenters saw an increased fee as a tool to force grazers off the rangelands.

## *Letters and Comments*

More than 1,300 people submitted letters or comment sheets during or after the meetings. One major issue predominated: should livestock grazing be allowed on public lands? Grazing versus no grazing pits a traditional Western culture and lifestyle with a distinct economic base against concerns for natural resources, especially ecosystems, riparian landscapes, and wildlife.

Comments can be divided into five major categories: social and economic, grazing fees, resource use/conflict, program administration, and rangeland conditions.

## *Social and Economic*

Specific areas of concern as they relate to the social and economic climate of the livestock industry are loss of jobs, loss of an entire lifestyle, loss of capital values of individual operations, the issue of takings, and the effect of grazing fee manipulation on local economies.



## Grazing Fees

There was a general consensus that a fair and equitable fee for the privilege of grazing on public lands needs to be addressed. Consideration should be given to an industry that operates on a slender profit margin; a fair return from commercial use of public resources should be obtained for the American public; and a differentiation should be made between small (family) and large, corporate operators. In addition, the fee should be tied to the rangeland condition through a system of incentives. It was also suggested that all uses of public land command a fee.

## Resource List/Conflict

A number of issues were raised relating to perceived conflicts between livestock grazing and other public land resources values or uses. Included in these are conflicts between livestock grazing and recreational use, adequate access, complete elimination of grazing from public lands, selective elimination of grazing in ecologically sensitive areas, conflicts between big game and livestock numbers, animal damage control, and the impacts of wild horse and burro populations on public rangelands.

## Program Administration

Of great concern was how the grazing program could or would be administered under significant regulation or policy changes. Issues include the capability of the BLM to fund and accomplish use supervision and enforcement, simplification of regulations, issues relating to leasing and to long-term and suspended nonuse, terms of permits, unrestricted public involvement in rangeland management decisions versus grazing advisory boards, intermingled landownership patterns, and preference for those ranching operations that have proven management ability to improve the rangeland ecosystem.

## Rangeland Conditions

Rangeland conditions issues involve the idea that the rangelands must be managed not only

for sustaining the livestock industry, but also to maintain a biologically diverse and balanced ecosystem. The quality of the rangeland should be the real issue, not the fee. Special attention needs to be paid to threatened and endangered species, riparian areas, desired plant communities, future condition, and potential natural vegetation.

## Panel Members

### Bozeman Meeting

#### Elected Officials Panel

Dennis Rehberg, Lt. Governor of Montana

Conrad Burns, Senator, Montana

#### Range and Resource Economics Panel

John Duffield, Professor of Economics,  
University of Montana

Joe Etchart, Operator, Hinsdale Livestock  
Company, Montana; President, Public  
Lands Council

Tim Gill, President, Montana Livestock  
Agricultural Credit, Inc.

Jim Hagenbarth, Rancher, Montana; Member,  
Montana Board of Livestock

Linn Kincannon,  
Public Lands Associate,  
Idaho Conservation League

James Phelps, Public Lands Chair,  
Montana Audubon Council

#### Management and Stewardship Panel

Mary Burke, Rancher, Washington; Chair,  
Private Lands Committee, National  
Cattlemen's Association

Kathleen Hadley, Rancher, Montana;  
Immediate Past President,



Montana Wildlife Federation; Vice President,  
National Center for Appropriate  
Technology

Brad Little, Owner, Little Land & Livestock,  
Idaho; Co-Manager, Highland Livestock;  
President, Idaho Wool Growers' Associa-  
tion

Dr. Clayton Marlow, Professor, College of  
Agriculture, Montana State University

Bob Munson, Executive Director, Rocky  
Mountain Elk Foundation

Glenn Hockett, Range Management  
Consultant

## **Reno Meeting**

### **Elected Officials Panel**

Cecil Andrus, Governor of Idaho

Sue Wagner, Lt. Governor of Nevada

Richard Bryan, Senator, Nevada

Harry Reid, Senator, Nevada

Barbara Vucanovich, Congresswoman, Nevada

Cary Peterson, Lands Commissioner, Utah

### **Range and Resource Economics Panel**

Jim Sullins, Area Livestock and Range Advisor  
for the University of California

Lorin Moench, Ranch Owner, Utah, Wyoming,  
and Nevada; Chair, American Lamb  
Council

Paula DelGiudice, President, Nevada Wildlife  
Federation

Johanna Wald, Senior Attorney, Natural  
Resources Defense Council; Member,  
Committee on Range Classification,  
National Research Council; Member,

Advisory Council, Yosemite Restoration  
Fund

Dr. Darwin Nielsen, Economics Department,  
Utah State University

David Lau, Independent Real Estate Appraiser,  
Oregon

Charles Coleman, Arizona Public Lands  
Council

## **Rangeland Management and Stewardship Panel**

Benito Romero, Manager, Sweetwater Ranch  
Company, Nevada; Chair, Nevada State  
Grazing Board; Vice President, Nevada  
Cattlemen's Association

"Doc" Hatfield, Rancher, Oregon

Rose Strickland, National Chair, Grazing and  
BLM Planning Subcommittee, Sierra Club;  
Past Board Member, Nevada Wildlife  
Federation

Dan Heinz, Member, American Wild Lands

Dr. Marc Liverman, Range Biologist, Oregon  
Department of Fish and Wildlife

Jack Metzger, Public Lands Council

Keith Kuhlman, Director, Real Estate Manage-  
ment Division, Commissioners of the  
Oklahoma Land Office

Dr. Thadis Box, Professor Emeritus, Utah State  
University; Adjunct Professor, New Mexico  
State University

## **Grand Junction Meeting**

### **Elected Officials Panel**

Roy Romer, Governor of Colorado

Walter Miller, Governor of South Dakota

Mike Sullivan, Governor of Wyoming



Robert Bennett, Senator, Utah

Hank Brown, Senator, Colorado

Ben Nighthorse Campbell, Senator, Colorado

### **Range and Resource Economics Panel**

Teresa Tescher-Voll, Rancher, Montana; Member, North Dakota Stockmen's Association

Jim Magagna, Rancher, Wyoming; Past President, American Sheep Industry Association

Tina Arapkiles, Regional Representative and Conservation Specialist, Sierra Club Southwest, Colorado

Darrell Knuffle, Central Rockies Regional Director, The Wilderness Society, Colorado; Former Deputy Under Secretary, Department of the Interior

Dr. Jon Souder, Professor of Natural Resources Economics, University of California-Berkeley, California

Dr. Robert Davis, Senior Research Associate, Environment and Behavior Program, University of Colorado

### **Management and Stewardship Panel**

Leonard Benson, Rancher, Colorado; President, Association of National Grasslands

Frank Garcia, Rancher, Colorado; Member, Southwestern Colorado Association Federal Land Bank

Scott Groene, Staff Attorney, Southern Utah Wilderness Alliance

June Rain, Executive Director, Wyoming Wildlife Federation

Mel Coleman, Rancher, Colorado; Founder, Coleman Natural Meats, Inc.

Jim Hook, Outfitter and Tour Guide, Utah

## **Albuquerque Meeting**

### **Elected Officials Panel**

Bruce King, Governor of New Mexico

Mark Killian, Arizona Speaker of the House (representing the Governor of Arizona)

### **Range and Resource Economics Panel**

Bill Humphries, Rancher, New Mexico; Part-time Resource Manager, New Mexico State University; Former New Mexico State Land Commissioner

Jim Fish, Manager of an Environmental Protection Lab, Sandia National Laboratories, New Mexico; Founder, Public Lands Action Network

Suzanne P. Van Gytenbeek, Regional Executive, Central Rockies Region, National Wildlife Federation

### **Stewardship and Management Panel**

Mike Casabonne, Rancher, New Mexico

Gary B. Donart, President, Society for Range Management; Professor of Range Science, New Mexico State University

Steve Johnson, Founder, Native Ecosystems, Arizona

Lee Otteni, Director, Resources Division, and Assistant Commissioner, New Mexico State Land Office

Susan Schock, President, Gila Watch, Arizona

## **Flagstaff Meeting**

### **Elected Officials Panel**

Fife Symington, Governor of Arizona

Dennis DeConcini, Senator, Arizona



Karan English, Congresswoman, Arizona

**Grazing Policy/Environmental  
Management Objectives Panel**

Charles Wilkinson, Moses Lasky Professor of  
Law, University of Colorado

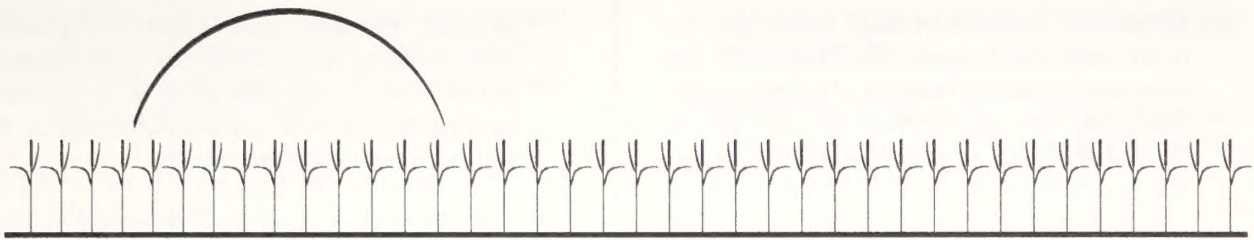
Bob Ohmart, Professor, Arizona State  
University

Wayne Elmore, Riparian Specialist, BLM,  
Oregon/Washington

Alan Kessler, Rancher, Arizona

Dan Daggett, Member, Participatory Range  
Management Team





# GLOSSARY

**ACCELERATED EROSION:** *Soil loss above natural levels resulting directly from human activities. Due to the slow rate of soil formation, accelerated erosion can lead to a permanent reduction in plant productivity.*

**ACTIVE PREFERENCE:** *The difference between grazing preference and suspended preference.*

**ACTIVE USE:** *Authorized livestock use for the current billing year.*

**ACTIVITY PLAN:** *A detailed and specific plan for managing a single resource program or plan element undertaken as needed to implement the more general resource management plan decisions. An activity plan is prepared for specific areas to reach specific resource management objectives within stated timeframes.*

**ADJUDICATION:** *The apportionment of grazing use on public rangelands among eligible applicants.*

**AFFECTED INTEREST:** *A person or organization that has expressed in writing to the authorized officer concern for the management of livestock grazing on a specific grazing allotment and who has been determined by the authorized officer to be an affected interest.*



**ALLOTMENT:** An area of land where one or more individuals graze their livestock. An allotment generally consists of federal rangelands, but may include intermingled parcels of private, state, or federal lands. BLM and the Forest Service stipulate the number of livestock and season of use for each allotment.

**ALLOTMENT MANAGEMENT PLAN (AMP):** A livestock grazing management plan dealing with a specific unit of rangeland and based on multiple use resource management objectives. The AMP considers livestock grazing in relation to other uses of rangelands and in relation to renewable resources—watershed, vegetation, and wildlife. An AMP establishes the seasons of use, the number of livestock to be permitted on rangelands, and the rangeland improvements needed.

**ALLUVIAL:** Pertaining to material that is carried and deposited by running water.

**ALLUVIUM:** Any sediment deposited by flowing water, as in a river bed, floodplain, or delta.

**ANADROMOUS FISH:** Fish such as salmon and steelhead trout that mature in the sea and migrate into streams to spawn.

**ANIMAL MONTH:** A month's tenure on rangeland by one animal of any class.

**ANIMAL UNIT:** A unit of measure for rangeland livestock equivalent to one mature cow or five sheep or five goats, all over 6 months of age. An animal unit is based on average daily forage consumption of 26 pounds of dry matter per day.

**ANIMAL UNIT MONTH (AUM):** The amount of forage needed to sustain one cow, five sheep, or five goats for a month. A full AUM's fee is charged for each month of grazing by adult animals if the grazing animal (1) is weaned, (2) is 6 months old or older when entering public land, or (3) will become 12 months old during the period of use. For fee purposes, An AUM is the amount of forage used by five weaned or adult sheep or goats or one cow, bull, steer, heifer, horse,

or mule. The term AUM is commonly used in three ways: (1) stocking rate as in X acres per AUM, (b) forage allocation as in X AUMs in allotment A, and (3) utilization as in X AUMs consumed from Unit B.

**ANNUAL PLANT:** A plant that completes its life cycle and dies in 1 year or less.

**APPROPRIATE MANAGEMENT LEVEL (AML):** The number of wild horses or burros suitable for a herd management area as determined through BLM's planning process and evaluation of monitoring data.

**APPROPRIATIVE WATER RIGHT:** Unappropriated water that is available for appropriation.

**AQUATIC HABITATS:** Habitats confined to streams, rivers, springs, lakes, ponds, reservoirs, and other water bodies.

**AQUATIC RESOURCES:** Plants and animals that live within or are entirely dependent upon water to live; living resources of aquatic habitats (fish, invertebrates, amphibians); aquatic species.

**AQUIFER:** A water-bearing bed or layer of permeable rock, sand, or gravel capable of yielding large amounts of water.

**AREA OF CRITICAL ENVIRONMENTAL CONCERN (ACEC):** An area within public lands where special management attention is required (1) to protect and prevent irreparable damage to fish and wildlife; important historic, cultural, or scenic values; or other natural systems or processes or (2) to protect life and safety from natural hazards.

**ARID REGION:** A region where precipitation is insufficient to support any but drought-adapted vegetation.

**ASPECT:** (1) The visual first impression of vegetation at a particular time or as seen from a specific point. (2) The predominant direction of slope of the land.

**AUTHORIZED OFFICER:** Any person authorized by the Secretary of the Interior to administer BLM's rangeland management program.



**AVAILABLE FORAGE:** Forage that can be grazed and still allow sustained forage production on rangeland. Available forage may or may not be authorized for grazing.

**AVIFAUNA:** All the birds of a specific region or time division.

**BASAL COVER (AREA):** The area of ground surface covered by the stem or stems of a rangeland plant, usually measured 1 inch above the soil, in contrast to the full spread of the foliage.

**BASE PROPERTY:**

**BLM:** Lands or water sources on a ranch that are owned by or under long-term control of the operator.

**Forest Service:** Lands and improvements owned and used by a permittee for a farm or ranch and designated by the permittee to qualify for a term grazing permit.

**BASE PROPERTY LEASES:** On BLM-administered lands, the long-term lease of base property.

**BED LOAD:** Sediment in a stream that moves by sliding, rolling, or bounding on or near the streambed.

**BEEF PRICE INDEX (BPI):** An index of the weighted average annual price for beef cattle, excluding calves, for the 11-Western State area as compared with a specific base period equal to 100.

**BEST MANAGEMENT PRACTICE (BMP):** State-approved practices that are found to be technologically, economically, and institutionally the most effective and practicable ways to prevent or reduce nonpoint-source pollution to meet water quality goals.

**BIODIVERSITY:** See BIOLOGICAL DIVERSITY.

**BIOLOGICAL DIVERSITY (BIODIVERSITY):** The full range of variability within and among living organisms and the ecological complexes in which they occur. Biological diversity encompasses ecosystem or com-

munity diversity, species diversity, and genetic diversity.

**BIOMASS:** The total amount of living material, plants and animals, above and below the soil surface in a biotic community.

**BIOTA:** The animal and plant life of a particular region considered as a total ecological entity.

**BIOTASEDIMENT YIELD:** The animal and plant life of a particular region considered as a total ecological entity.

**BIOTIC COMMUNITIES:** The assemblage of native and exotic plants and animals associated with a particular site or landscape, including microorganisms, fungi, algae, vascular and herbaceous plants, invertebrates, and vertebrates. These assemblages and their biotic and abiotic relationships serve landscape and watershed functions by promoting soil properties supporting water infiltration and storage, energy and nutrient fixation, recycling and transfer, species survival, and sustainable population dynamics.

**BLM DISTRICT:** A BLM administrative subdivision responsible for a specific area of a state. A district is administered by a district manager with a technical and an administrative staff. See GRAZING DISTRICT.

**BROWSE:** Young twigs, leaves, and the tender shoots of plants or shrubs that animals eat.

**CARRYING CAPACITY:** The maximum stocking rate possible without damaging vegetation or related resources. Carrying capacity may vary from year to year on the same area due to fluctuating forage production.

**CERTIFICATE:** A document containing a certified statement, especially as to the truth of something.

**CAPILLARY ACTION:** The action by which water is drawn up through the soil in small interstices or tubes as a result of surface tension. Capillary action is most common in clay soils.



**CATEGORY 1 SPECIES:** Species for which the Fish and Wildlife Service has enough information on biological vulnerability and threats to support their listing as endangered or threatened species.

**CATEGORY 2 SPECIES:** Species for which the Fish and Wildlife Service has information suggesting the possible appropriateness for listing as endangered or threatened.

**CHAPARRAL:** A vegetation community consisting of dense and often thorny shrubs and small trees.

**CHAINING:** A mechanical vegetation treatment to improve rangeland for livestock grazing in which an anchor chain is extended between two tractors and dragged over the terrain to uproot brush and small trees such as pinyon and juniper. See RAILING.

**CIRQUE:** A glacially carved steep hollow at the upper end of a high mountain valley, often containing a small lake.

**CLASS OF LIVESTOCK:** Description of age or sex group for a particular kind of livestock, such as cow, bull, calf, yearling, ewe, ram, or lamb.

**CLIMATIC REGIME:** Areas with similar temperature and precipitation characteristics that form frameworks for comparing climatic conditions around the world.

**CLIMAX VEGETATION:** The final vegetation community and highest ecological development of a plant community that emerges after a series of successive vegetational stages. The climax community perpetuates itself indefinitely unless disturbed by outside forces.

**COLD DESERT:** Areas that are consistently dry (evaporation equals or exceeds precipitation), that have 7 or fewer months when temperatures average above 50° F, and that have average annual temperatures below 65° F.

**COLLUVIAL:** Pertaining to soil and rock material carried chiefly by gravity, such as material accumulating at the bottom of a cliff.

**COMBINED INDEX (CI):** An index produced by subtracting the PPI (Prices Paid Index) from the BPI (Beef Price Index)  $BPI - PPI = CI$ .

**COMMENSURABILITY:** Ability of a permittee's base ranch property to support permitted livestock while such livestock are off public lands.

**COMMENSURATE PROPERTY:** Land or water for livestock that qualifies a person for a grazing preference on public land. See BASE PROPERTY.

**COMMUNITY:** An assemblage of plant and animal populations in a common spatial arrangement.

**COMMUNITY OF INTEREST:** All parties concerned with the management and function of a geographical unit of land. The tie between community of interest, watershed management, and ecosystem management is important. Watersheds are the basic functional units of land that tie together the interests of a variety of participants, including ranchers, farmers, agencies, and town and city representatives. Other participants concerned with the relationships of individual watersheds to broader ecological functions should participate as members of the community of interest to influence management decisions relative to these broader perspectives.

**COMPETITIVE BIDDING:** Selling federal forage to the highest bidder.

**COMPLIANCE INSPECTIONS:** The act of verifying that users of public lands are complying with laws, permits, and rules of conduct.

**CONSERVATION RESERVE PROGRAM:** A government program, commonly used in the Soil Conservation Service, that offers long-term rental and cost-sharing assistance to establish permanent vegetation cover on cropland that is highly erodible or contributing to a serious water quality problem.

**CONSERVATION USE:** Nonuse (removing livestock from allotments) for up to 10 years for resource protection. Under the Proposed Action, the agencies could initiate conser-



vation use. Under the Environmental Enhancement alternative either the agency or the permittee could initiate conservation use.

**CONSISTENCY:** Maintaining consistent procedures among BLM offices as well as between BLM and other agencies, such as the Forest Service.

**CONTINENTAL GLACIER:** a glacier of considerable thickness covering a large part of a continent or an area of 50,000 square kilometers, obscuring the relief of the underlying surface. Contemporary examples include ice sheets covering Greenland and Antarctica.

**CONTINUOUS SEASON-LONG GRAZING:** Grazing that occurs during the same period of use every year.

**CONTROL:** To be responsible for and providing care and management of base property, livestock, or both.

**COOL-SEASON SPECIES:** Plants whose major growth occurs during the late fall, winter, and early spring.

**COOPERATIVE MANAGEMENT AGREEMENT:** A document that describes agreements made between BLM and the public on adjustments in grazing use. This document also defines the specific adjustments and the schedule of adjustments (usually over a 5-year period).

**COORDINATED RESOURCE MANAGEMENT PLAN:** A plan for managing one or more grazing allotments that involves all affected resources, such as vegetation, wildlife, soil, and water.

**COVER:** Plants or objects used by wild animals for nesting, rearing of young, escape from predators, or protection from harmful environmental conditions.

**COW-CALF OPERATION:** A livestock operation in which a base breeding herd of mother cows and bulls is maintained. The cows produce a calf crop each year, and the operation keeps some heifer calves from each calf

crop for breeding herd replacements. The rest of the calf crop is sold between the ages of 6 and 12 months along with old or non-productive cows and bulls.

**CRITICAL HABITAT, DESIGNATED:** Specific parts of an area occupied by a federally listed threatened or endangered plant or animal at the time it is listed that contain physical or biological features essential to the conservation of the species or that may require special management or protection. Critical habitat may also include specific areas outside an area occupied by a federally listed species if the Secretary of the Interior determines that these areas are essential for the conservation of the species.

**CRITICAL LINK SPECIES:** See KEYSTONE SPECIES.

**CROSSING PERMIT:** Authorization to move livestock across public land for any legitimate purpose.

**CRYPTOBIOTIC (CRYPTOGAMIC) CRUST:** A biological community that forms a surface layer or crust on some soils. This community consists of cyanobacteria (blue-green bacteria), microfungi, mosses, lichens, and green algae. This community performs many important functions, including fixing nitrogen and carbon, maintaining soil surface stability, and preventing erosion. Cryptobiotic crusts also influence the nutrient levels of soils and the status and germination of plants in the desert. These crusts are slow to recover after severe disturbance, requiring 40 years or more to recolonize even small areas.

**CULTURAL PROPERTY:** The definite location of a past human activity, occupation, or use identifiable through field inventory, historic documentation, or oral evidence. Cultural properties include prehistoric and historic archaeological remains, or architectural sites, structures, objects, or places with important public and scientific uses.

**CULTURAL RESOURCES:** The fragile and non-renewable remains of human activity found in historic districts, sites, buildings, and ar-

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tifacts that are important in past and present human events.

**CUMULATIVE:** Increasing or enlarging by successive addition.

**DATA YEAR:** The year, generally a calendar year, for which data is collected, or the period to which the data pertains.

**DEFOLIATION:** The removal of plant leaves, by grazing or browsing, chemical action, or natural phenomena such as hail, fire, or frost.

**DEPENDENCY:** the AUMs of public forage divided by the total AUMs a livestock herd needs.

**DESERTIFICATION or DESERTIZATION:** For purposes of this EIS, the two terms may be used interchangeably. Though the term desertization is technically more accurate in describing landscape changes induced by human activity, many people commonly refer to such human-induced changes as desertification.

(a) The sustained decline or destruction of the biological productivity of arid and semi-arid lands resulting from human-induced stresses, sometimes in conjunction with extreme natural events. If continued or unchecked, such stresses over the long term may lead to ecological degradation and ultimately to desert-like conditions.

(b) The expansion of desert-like conditions and landscapes to areas where they should not occur climatically or where they did not occur in historical times. This impact is worsened by temporary climatic rises, especially droughts that occur periodically several times per century. The impact may be so great that the resulting environmental deterioration becomes irreversible.

**DESERT PAVEMENT:** A desert ground surface of thin, smooth or sheet-like, wind-polished, closely packed pebbles, boulders, gravel, and other rock fragments, where wind and sheetwash have removed all smaller particles. The fragments are commonly cemented by mineralized solution.

**DESIRED FUTURE CONDITION:** The future condition of rangeland resources on a landscape scale that meet management objectives. Desired future condition is based on ecological (such as desired plant community) social, and economic considerations during the land and resource management planning process. Desired future condition is usually expressed as ecological status or management status of vegetation (species composition, habitat diversity, age and size classes of species) and desired soil qualities (conditions of soil cover, erosion, compaction, loss of soil productivity).

**DESIRED PLANT COMMUNITY (DPC):** The plant community that has been determined through a land use or management plan to best meet the plan's objectives for a site. A real, documented plant community that embodies the resource attributes needed for the present or potential use of an area, the desired plant community is consistent with the site's capability to produce the required resource attributes through natural succession, management intervention, or a combination of both.

**DEVELOPED RECREATION SITES:** Recreation sites that have facilities, structures, or developments such as drinking water, bathrooms, picnic tables, and developed campsites.

**DIRECT:** To be related exactly and without interruption to or from other sources.

**DISCHARGE:** The rate of flow or volume of water flowing in a stream at a give place or within a given period of time.

**DISCLIMAX:** A relatively stable ecological community that has displaced the climax community as a result of repeated or continuous disturbance by humans, domesticated animals, or natural events.

**DOCTRINE OF PRIOR APPROPRIATION:** Water rights doctrine adopted by most western states, giving the first person to use water from a stream the first right to such water. If the first user does not consume all of the water, then the second and later users can appropriate water for their needs.



**DRAINAGE:** A water source, such as a stream.

**ECOLOGICAL CONDITION (OR HEALTH):** See ECOLOGICAL STATUS.

**ECOLOGICAL SITE:** A distinctive kind of rangeland that differs from other kinds of rangeland in its ability to produce a characteristic natural plant community.

**ECOLOGICAL SITE CAPABILITY:** The highest ecological status an ecological site can attain given political, social, or economical constraints.

**ECOLOGICAL STATUS:** The present state of vegetation and soil protection of an ecological site in relation to the potential natural community for the site. Vegetation status is the expression of the relative degree to which the kind, proportions, and amounts of plants in a community resemble that of the potential natural community.

**ECOLOGICAL SUCCESSION:** An ecosystem's gradual evolution to a stable state. If, through the ability of its populations and elements, an ecosystem can absorb changes, it tends to persist and become stable through time.

**ECOREGION:** An hierarchical framework of ecological units formed by stratifying the earth into progressively smaller areas of increasingly uniform ecological potential for use in ecosystem management. Ecoregions would be the broadest application. Ecoregions are recognized by differences in gross physiology and global, continental, and regional climatic regimes.

**ECOSYSTEM:** A complete interacting system of organisms considered together with their environment.

**ECOSYSTEM MANAGEMENT:** (A) The skillful use of ecological, economic, social, and managerial principles in managing ecosystems to produce, restore, or sustain ecosystem integrity and desired conditions, uses, products, values, and services over the long term. (B) A process of land and resource management that emphasizes the care and stewardship of an area to ensure that hu-

man activities will be carried out to protect natural processes, natural biodiversity, and ecological integrity.

**ECOTONE:** A transition line or strip of vegetation between two communities having characteristics of both kinds of neighboring vegetation as well as those of its own.

**EDGE EFFECT:** The influence of two adjoining plant communities on the plants and animals between them.

**EFFECTIVENESS:** The ability to work towards achieving resource goals and objectives.

**EFFICIENCY:** The proportion of funding spent on program administration relative to funding spent on implementation.

**ENDANGERED SPECIES:** Any animal or plant species in danger of extinction throughout all or a significant portion of its range as designated by the U.S. Fish and Wildlife Service under provisions of the Endangered Species Act.

**ENTITLEMENT ACRES:** Lands owned by the Federal Government that are included in the formulas used to calculate payments in lieu of taxes.

**ENTITLEMENT LANDS:** See ENTITLEMENT ACRES.

**ENVIRONMENTAL ASSESSMENT (EA):** A concise public document for which a federal agency is responsible. An EA serves (1) to briefly provide enough evidence and analysis for determining whether to prepare an environmental impact statement (EIS) or a finding of no significant impact; and to aid an agency's compliance with the National Environmental Policy Act when no EIS is needed; and (3) to facilitate preparation of an EIS when one is needed. See ENVIRONMENTAL IMPACT STATEMENT.

**ENVIRONMENTAL CONSEQUENCES:** A situation that naturally or logically follows as a result of an action. Commonly used in environmental impact statements for discussions about how the human environment, which includes the natural and physical



environment and the relationship of people with that environment, is influenced by the government's actions.

**ENVIRONMENTAL IMPACT STATEMENT**

**(EIS):** An analytical document that portrays potential impacts on the human environment of a particular course of action and its possible alternatives. Required by the National Environmental Policy Act (NEPA), an EIS is prepared for use by decisionmakers to weigh the environmental consequences of a potential decision.

**EPHEMERAL RANGE:** A rangeland that does not consistently produce enough forage to sustain a livestock operation but may briefly produce unusual volumes of forage to accommodate livestock grazing.

**EROSION:** the wearing away of land by water, wind, gravitation or other geologic agents. Natural erosion is a geologic process that occurs under natural conditions of climate and vegetation.

**ESTUARINE:** The environmental system of an estuary and those transitional areas that are consistently influenced or affected by water from an estuary.

**ESTUARY:** A body of water in which stream water mixes with and measurably dilutes sea water.

**EXOTIC SPECIES:** A species that is not native to the area where it is found.

**EXOTIC VEGETATION:** Plants that are not native to the region in which they are found.

**EXURBANITES:** People who relocate from urban to rural areas.

**EVAPOTRANSPIRATION:** The combined process by which water is transferred from the earth's surface (from soil, snow, water bodies, vegetation) to the atmosphere. See **TRANSPIRATION**.

**FAIR MARKET VALUE (FMV):** The amount in cash, or on terms reasonably equivalent to cash, for which in all probability something

would be sold by a knowledgeable owner will but not obligated to sell to a knowledgeable purchaser who desires but is not obligated to buy.

**FEDERAL LAND POLICY AND MANAGEMENT ACT OF 1976 (FLPMA):**

The act that (1) sets out for the Bureau of Land Management standards for managing the public lands, including land use planning, sales, withdrawals, acquisitions, and exchanges; (2) authorizes the setting up of local advisory councils representing major citizens groups interested in land use planning and management; (3) established criteria for review of proposed wilderness area; and (4) provides guidelines for other aspects of public land management such as grazing.

**FEE YEAR:** The 12-month period covered by a fee charged by BLM and the Forest Service, March 1 through the last day in February of the following year.

**FENCELINE CONTRAST:** A visual contrast created by the combined effect of a fence and the grazing use on either side of it. Fenceline contrast usually increase when livestock use on one side of the fence radically differs from that on the other side.

**FIRE CLIMAX:** Any biotic community that maintains its vegetation composition and structure only as a result of periodic burning. Also see **DISCLIMAX**.

**FISHERY:** Habitat that supports some in the propagation and maintenance of fish.

**FLEXIBILITY:** A characteristic of a grazing management plan that allows it to accommodate changing conditions.

**FOLIAR COVER:** The percentage of ground covered by a downward vertical projection of the aerial portion of plant foliage, excluding small openings in the canopy. Foliar cover is always less than canopy cover. Total foliar cover of all species may exceed 100 percent.

**FORAGE:** All browse and herbaceous growth available and acceptable to grazing animals



or that may be harvested for feeding purposes. Forage includes pasture, rangelands, and crop aftermath. Whereas, feed includes forage, hay, and grains.

**FORAGE VALUE INDEX (FVI):** A derived index of the relative change in the previous year's average monthly rate per head for pasturing cattle on privately owned land in the West.

**FORB:** A herbaceous plant that is not a grass, sedge, or rush.

**FOREST PLAN:** See NATIONAL FOREST LAND AND RESOURCE MANAGEMENT PLAN.

**FULL FORCE AND EFFECT:** A process for allowing authorized officers to make decisions effective immediately and reduce resource damage. When a decision is in full force and effect, one wishing to appeal must either have the decision stayed by an administrative law judge or enjoined by a federal court judge. This process is allowed under the Department of the Interior's rules and makes a decision the Department's final decision.

**FUNCTIONING AT RISK:** Uplands or riparian-wetland areas that are properly functioning, but a soil, water, or vegetation attribute makes them susceptible to degradation and lessens their ability to sustain natural biotic communities. Uplands are particularly at risk if their soils are susceptible to degradation. Human activities, past or present, may increase the risks.

**GOAL:** The desired state or condition that a resource management policy or program is designated to achieve. Narrower and more specific than objectives, goals are usually not measurable and may not have specific dates by which they must be reached. Objectives are developed by first understanding one's goals.

**GRANGER-THYE ACT OF 1950:** An act that established direction for some aspects of National Forest System management, including authority for the Forest Service to assist with work on lands of other ownership, use

of grazing fee receipts for rangeland improvements, authorization to issue grazing permits for terms up to 10 years, authority to participate in funding cooperative forestry and rangeland research, and establishing grazing advisory boards. NOTE: Section 403(f) of the Federal Land Policy and Management Act of 1976 removed authority for grazing advisory boards as of December 31, 1985.

**GRASSLANDS:** Lands on which the vegetation is dominated by grasses, grasslike plants, or forbs. Nonforest land is classed as grassland if herbaceous vegetation constitutes at least 80 percent of the canopy cover, excluding tress. Lands that are not now grasslands but were originally or could become grasslands through natural succession may be classified as potential natural grasslands.

**GRAZING:** Consumption of native forage from rangelands or pastures by livestock or wildlife.

**GRAZING ADVISORY BOARD:** Groups that advise BLM on livestock grazing-related questions that arise in preparing allotment management plans and spending Range Betterment Funds. Consisting of from five to eight grazing permittees or lessees elected by their peers, grazing advisory boards typically represent BLM districts. In some states grazing advisory boards also administer and distribute grazing fee receipts returned to the states and counties but this function is authorized by state rather than federal regulation.

**GRAZING ALLOTMENT:** An area where one or more livestock operators graze their livestock. An allotment generally consists of federal land but may include parcels of private or state-owned land.

**GRAZING DISTRICT:** An administrative unit of BLM-managed rangelands established by the Secretary of the Interior under the Taylor Grazing Act of 1934. Grazing units are not the same as BLM administrative districts. See BLM DISTRICT.

**GRAZING FEE:** A charge, usually on a monthly basis, for grazing a specific kind of livestock.



**GRAZING FEE YEAR:** For fee collection purposes, from March 1 through the last day in February of the following year.

**GRAZING PERMIT/LICENSE/LEASE:** Official written permission to graze a specific number, kind, and class of livestock for a specified time period on a defined rangeland.

**GRAZING PREFERENCE:** The status of qualified grazing permittees acquired by grant, prior use, or purchase, that entitles them to special consideration over applicants who have not acquired preferences.

**GRAZING PRIVILEGES:** The use of public land for livestock grazing under permits or leases.

**GRAZING REGIME:** See GRAZING SYSTEM.

**GRAZING REST:** Deferral of grazing on an area.

**GRAZING SEASON:** On federal lands, an established period for which grazing permits are issued.

**GRAZING SYSTEM:** A systematic sequence of grazing use and nonuse of an allotment to meet multiple use goals by improving the quality and amount of vegetation.

**GROUND COVER:** The percentage of material, other than bare ground, covering the land surface. Ground cover may include live and standing vegetation, litter, gravel, cobble, stones, boulders, and bedrock.

**GROWING SEASON:** Generally, the period of the year during which the temperature of vegetation remains high enough to allow plant growth. The most common measure of this period is the number of days between the last frost in the spring and the first frost in the fall.

**GUIDELINE:** A statement of recommended procedure for achieving an objective.

**HABITAT:** The natural abode of a plant or animal, including all biotic, climatic, and soil factors affecting life.

**HALOGETON:** A poisonous, succulent plant growing predominantly on disturbed sites

in the Great Basin and Snake River plain. Cattle avoid this plant, but sheep eat it and die as a result.

**HEAD MONTH:** A month's use and occupancy of rangeland by one animal except for sheep or goats. A full head month's fee is charged for each month of grazing by adult animals if the grazing animal (1) is weaned, (2) is 6 months old or older when entering National Forest System land, or (3) will become 12 months old during the period of use. For fee purposes, a head month is equivalent to five weaned or adult sheep or goats or one cow, bull, steer, heifer, horse, or mule.

**HERBACEOUS:** Vegetation growth with little or no woody component. Nonwoody vegetation, such as graminoids and forbs.

**HERBIVORES:** Animals that subsist mainly or entirely on plants or plant materials.

**HERD MANAGEMENT AREA (HMA):** The area of wild horse or burro habitat covered by a herd management area plan.

**HERD MANAGEMENT AREA PLAN (HMAP):** Site-specific plans that define objectives for the HMA and prescribe actions to meet objectives. HMAPs outline details of burro or horse capture plans, adoption programs, and long-term population management. There are 91 HMAPs and funding allows for completion of approximately 10 plans per year.

**HORIZON:** See SOIL HORIZON.

**HOT DESERT:** Areas that are consistently dry, the evaporation equals or exceeds precipitation, have eight or more months of an average temperature above 50°, and the annual average temperature exceeds 65°F.

**IMPACTS:** The effect of one thing upon another. Impacts may be beneficial or adverse. See ENVIRONMENTAL CONSEQUENCES.

**IMPROVEMENT:** See RANGE BETTERMENT.

**IMPROVEMENT MAINTENANCE:** To preserve or keep in serviceable condition the struc-



tures built to facilitate the use of federal rangelands by livestock and wildlife.

**INCIDENTAL USE:** Inadvertent unauthorized use that results in little or no resource damage.

**INDEX:** A number used to express a ratio or show relative changes from a fixed point or base condition.

**INFILTRATION:** The downward entry of water into the soil or other material.

**INFRASTRUCTURE:** The set of systems and facilities that support a region or community's social and economic structures. Examples of such systems include transportation, education, medical service, communication, and fire and police protection.

**INTERDISCIPLINARY TEAM:** A team of varied land use and resource specialists formed to provide a coordinated, integrated information base for overall land use planning and management.

**INTERIOR BOARD OF LAND APPEALS (IBLA):** A Board within the Department of the Interior's Office of Hearings and Appeals that acts for the Secretary of the Interior in responding to appeals of decisions on the use and disposition of public lands and resources. Because IBLA acts for and on behalf of the Secretary of the Interior, its decisions usually represent the Department's final decision but are subject to the Secretary's review and to appeal in federal court. See OFFICE OF HEARINGS AND APPEALS.

**INTERMITTENT STREAMS:** A stream or portion of a stream that flows only in direct response to precipitation. Such a stream receives little or no water from springs and no long-continued supply from melting snow or other sources. It is dry for a large part of the year.

**INVERSION:** The state of the atmosphere in which a layer of cool air is trapped near the earth's surface by an overlying layer of warm air. Serious air pollution problems may re-

sult from the limited mixing depth below the inversion.

**ISOLATED LAND:** Land of one ownership enclosed within the boundaries of another ownership.

**KEYSTONE SPECIES:** Species that provide a special habitat that other species depend on, without which, some wildlife would become severely depleted. Some examples of keystone species are beavers, who create ponds, and prairie dogs, who create burrows.

**KEY SPECIES:** (1) Species that, because of their importance, must be considered in a management program; or (2) forage species whose use shows the degree of use of associated species.

**KIND OF LIVESTOCK:** An animal species or species group such as sheep, cattle, goats, horses, or burros.

**LACUSTRINE:** Of or pertaining to a lake.

**LACTATING PERIOD:** Period during which animals secrete milk for feeding their young; nursing period.

**LAND TREATMENT:** A technique or action customarily applied to rehabilitate or improve a damaged or deteriorated area through one or more treatments.

**LAND USE PLAN:** Any document developed to define the kinds of use, goals and objectives, management practices and activities that will be allowed to occur on an individual or group of parcels of land.

**LANDFORM:** A discernible natural landscape that exists as a result of geological activity such as a plateau, plain, basin, or mountain.

**LEASE:** See GRAZING LEASE.

**LESSEE:** One who has specified rights or privileges under a lease. The terms written in the lease define the actual length of time and seasons a lease is good for.



**LEK:** An assembly area where birds, especially sage grouse, carry on display and courtship behavior.

**LITTER:** The uppermost layer of organic debris on the soil surface, essentially the freshly fallen or slightly decomposed vegetal material.

**LIVESTOCK:** Domestic animals, including beef cattle, sheep, goats, and horses kept or produced on farms or ranches.

**LIVESTOCK TRESPASS:** See UNAUTHORIZED USE.

**MACROINVERTEBRATES:** Invertebrates, including insects, crustaceans, mollusks, and freshwater earthworms, that can be seen with the unaided eye. In the aquatic environment macroinvertebrates provide a link in the food chain between microscopic, multi-celled organisms and fish and are essential to the growth and production of fish. Because of their strict habitat requirements, macroinvertebrates are sampled to help determine aquatic habitat changes.

**MAJOR LAND RESOURCE AREA:** Geographically associated land resource units with particular patterns of soils, climate, vegetation types, water resources, and land uses.

**MANAGEMENT LEASE (PASTURE AGREEMENT):** A lease or agreement in which a permittee contracts with another party to graze that party's livestock on federal lands under the permittee's permit. BLM authorizes such agreements as long as permittees certify that they control the livestock.

**MEDITERRANEAN CLIMATE:** A subtropical dry summer climate, where the average temperature is above 50° F for eight or more months and the coldest month averages below 65° F. The summers are cloudless and dry, and 70 percent or more of the annual precipitation falls during the winter.

**MESIC:** Pertaining to environmental conditions that have medium moisture supplies rather than hygric (wet) or xeric (dry) conditions.

**MICROCLIMATE:** Local site-specific climatic conditions that differ from the general climate because of local differences in elevation and exposure.

**MORaine:** An accumulation of boulders, stones, and other earth debris carried and deposited by a glacier.

**MOTORIZED USE:** Recreation use in which driving is the main activity and an end unto itself. Examples include scenic drives in the family car or operating off-highway vehicles for fun.

**MULTIPLE USE:** A combination of balanced and diverse resource uses that considers long-term needs for renewable and nonrenewable resources, including recreation, rangeland, timber, minerals, watershed, and wildlife, along with scenic, scientific, and cultural values.

**NATIONAL ADVISORY BOARD COUNCIL (NABC):** No longer existing, this committee consisted of members of BLM district advisory boards selected to consider on a national basis legislation, regulations, and policy, and to advise the Secretary of the Interior on grazing management on public lands.

**NATIONAL FOREST MANAGEMENT ACT OF 1976 (NFMA):** The federal law that amended the Forest and Rangeland Renewable Resources Planning Act of 1974 to (1) require the incorporation of standards and guidelines in forest plans; (2) provide for public participation in developing and revising forest plans; (3) ensure that forest plans provide for multiple use and sustained yield, including coordination of outdoor recreation, rangeland, timber, watershed, wildlife and fish, and wilderness; (4) ensure that forest plans consider the economic and environmental aspects of various systems of renewable resource management; (5) ensure that forest plans provide for diversity of plan and animal communities; and (6) require that permits and contracts conform to forest plans.



**NATIONAL FOREST SYSTEM:** A system of federally managed forest, rangelands, and related lands consisting of the national forests, the national grasslands; land utilization projects administered under Title III of the Bankhead-Jones Farm Tenant Act; and other lands, waters, or interests therein that are administered by the Forest Service or designated for administration through the Forest Service as part of the system.

**NATIONAL GRASSLANDS:** A unit designated by the Secretary of Agriculture and permanently held by the Department of Agriculture under Title II of the Bankhead-Jones Farm Tenant Act. The main purposes of national grasslands are to promote the development of grassland agriculture and sustained yield management of the soil, water, forage, fish and wildlife, recreation, and timber resources; to demonstrate sound and practical principles of land use to groups to favorably influence nearby areas and economies; to encourage user groups to assist in administering national grasslands; and to demonstrate management flexibility and innovation in the design and implementing of resource management activities.

**NATIONAL HISTORIC INTEREST:** Any of the places or sites on the National Register of Historic Places or having another national designation such as an area of critical environmental concern, national historic landmark, or research natural areas.

**NATIONAL HISTORIC LANDMARKS:** Site, buildings, structures, or objects of national historic or architectural significance that have been designated by the Secretary of the Interior. The National Historic Landmarks Program is administered by the National Park Service.

**NATIONAL NATURAL LANDMARKS:** Nationally significant natural (geologic and biological) sites and features that have been designated by the Secretary of the Interior. The National Natural Landmarks Program is administered by the National Park Service.

**NATIONAL WILD AND SCENIC RIVERS SYSTEM:** A system of nationally designated riv-

ers and their immediate environments that have outstanding scenic, recreational, geologic, fish and wildlife, historic, cultural, and other similar values and are preserved in a free-flowing condition. The system consists of three types of streams: (1) Recreation—rivers or sections of rivers readily accessible by road or railroad that may have some development along their shorelines and may have undergone some impoundment or diversion in the past, (2) scenic—rivers or sections of rivers free of impoundments with shorelines or watershed still largely undeveloped but accessible in places by roads, and (3) Wild—rivers or sections of rivers free of impoundments and generally inaccessible except by trails with shorelines or shorelines essentially primitive and waters unpolluted.

**NATIVE FOOD-SOURCE PLANTS:** Plants used as a traditional food source by Native Americans.

**NATIVE SPECIES (FISH):** Any species that naturally occurred within a given body of water.

**NEOTROPICAL MIGRATORY BIRDS:** Birds that breed in the United States and Canada and later migrate south to Central and South America, Mexico, and the Caribbean islands. These birds include almost half of the bird species that breed in the United States and Canada.

**NEPA ANALYSIS:** Analysis conducted during the preparation of documents required under the National Environmental Policy Act, particularly environmental assessments and environmental impact statements.

**NONFUNCTIONING CONDITION:** Riparian-wetland areas are considered to be in nonfunctioning condition when they don't provide adequate vegetation, landform, or large woody debris to dissipate stream energy associated with high flows and thus are not reducing erosion, improving water quality, or other normal characteristics of riparian areas. The absence of certain physical attributes such as a floodplain where one should be are indicators of nonfunctioning conditions.



Uplands are considered to be in nonfunctioning condition when the existing vegetation and ground cover don't maintain soils capable of sustaining natural biotic communities.

See PROPERLY FUNCTIONING CONDITION and FUNCTIONING AT RISK.

**NONGAME WILDLIFE:** For the analysis in this environmental impact statement, all wildlife except big game, upland game, waterfowl, raptors, resident fish, and threatened and endangered species.

**NONMOTORIZED USE:** Any recreation use in which the driving of a vehicle is not an end unto itself. Vehicles may be used to carry recreationists and their equipment to the site or area where nonmotorized use occurs.

**NONPOINT-SOURCE POLLUTION:** Water pollution whose sources cannot be pinpointed but that can be best controlled by proper soil, water, and land management practices.

**NONUSE:** (1) absence of grazing use on current year's forage production. (2) lack of exercise, temporarily, of a grazing privilege on grazing lands. (3) an authorization to refrain, temporarily, from placing livestock on public rangelands without loss of preference for future conditions.

**NOXIOUS PLANT:** A plant that is undesirable because it's unwholesome to rangeland or animals.

**OBJECTIVE:** The planned results to be achieved within a stated time period. Objectives are subordinate to goals, more narrow in scope, and shorter in range. Objectives must specify time periods for completion, and products or achievements that are measurable.

**OFF-HIGHWAY VEHICLE:** Any vehicle that is not permitted on a highway. Including dune buggies, four-wheelers, and dirt bikes, these vehicles are often driven for recreational purposes.

**OFFICE OF HEARINGS AND APPEALS:** A division of the Department of the Interior that, in cooperation with the Office of the Solicitor, is responsible for all of the Department's legal affairs. The Office of Hearings and Appeals has two subdivisions, the Board of Land Appeals and the Hearings Division.

**OPERATOR:** One who is in the business of buying, raising, and selling livestock.

**OPPORTUNISTIC PLANTS:** Plants adapted for surviving in variable, unpredictable, or transient environments.

**OROGRAPHIC EFFECT:** The effect of mountains on the passing flow of air, which may cause its lifting or diverting, creation of clouds, and increases in leeward precipitation.

**OUTWASH PLAIN:** A plain formed from mineral material that has been carried and sorted by water from higher to lower elevations.

**OVERSTORY:** The upper canopy or canopies of plants, usually referring to trees, shrubs, and vines.

**PACFISH:** An ecosystem approach to managing anadromous fish habitat that the Bureau of Land Management and the Forest Service are developing to address the decline of this type habitat.

**PALATABILITY:** The relish with which a particular plant species or part is consumed by an animal.

**PALEONTOLOGICAL RESOURCES (FOSSILS):** The physical remains of plants and animals preserved in soils and sedimentary rock formations. Paleontological resources are important for understanding past environments, environmental change, and the evolution of life.

**PARTICULATE MATTER:** Fine liquid or solid particles emitted into the atmosphere, such as dust, smoke, mist fumes, or smog.

**PASSERINE BIRDS:** Birds of the order Passeriformes, which includes perching birds and songbirds such as blackbirds, jays,



finches, warblers, and sparrows. More than half of all known birds belong to this order.

**PASTURE:** (1) Land that is separated from other areas by a fence or natural barriers. (2) The act of letting livestock graze land for forage.

**PASTURE AGREEMENTS:** See **MANAGEMENT LEASES**.

**PAYMENTS-IN-LIEU-OF-TAXES (PILT):** Payments made by the Federal Government to local government units (usually counties) where certain federal lands are located to compensate these governments for property taxes the Federal Government does not pay for the federal lands.

**PERENNIAL STREAM:** A stream that flows throughout the year for many years.

**PERMEABILITY, SOIL:** The ease with which gases, liquids (water), or plant roots penetrate or pass through a bulk mass of soil or a layer of soil. Since different soil horizons vary in permeability, the particular horizon under question should be designated.

**PERMIT:** See **GRAZING PERMIT**.

**PERMITTEE:** One who holds a permit to graze livestock on state, federal, or certain privately-owned lands.

**PERENNIAL PLANT:** A plant that has a life cycle of 3 or more years.

**pH:** A measure of acidity or hydrogen ion activity. Neutral is pH 7.0. All values below 7.0 are acid, and all above 7.0 are alkaline.

**PHREATOPHYTE:** A plant that absorbs its water from a permanent supply in the ground.

**PLANT SUCCESSION:** See **ECOLOGICAL SUCCESSION**.

**POTENTIAL NATURAL COMMUNITIES (PNC):** The stable biotic community that would become established on an ecological site if all successional stages were completed without human interference under present environmental conditions.

**PRESCRIBED BURN:** A controlled fire used to meet such management goals as reducing shrub and tree invasion or changing species composition toward a more desirable forage.

**PRICES PAID INDEX (PPI):** An index of prices paid by farmers for commodities and services, interest, taxes, and farm wages, as collected and published by the Statistical Reporting Service in *Agricultural Prices*, as compared to a specific base period equal to 100.

**PRIMARY CONTACT RECREATION:** Any recreation activity involving prolonged and intimate contact with the water, such as swimming, water skiing, surfing, kayaking, tubing, and wading. See **SECONDARY CONTACT RECREATION**.

**PRIOR USE:** Grazing use preceding a specified time such as the 5-year period immediately preceding June 28, 1934.

**PRIVATE GRAZING LAND LEASE RATE INDEX (PGLLRI):** See **FORAGE VALUE INDEX**.

**PRIVILEGE:** The benefit or advantage enjoyed by a person or company beyond the common advantage of other citizens to graze livestock on federal lands. Privilege may be created by permit, license, lease, or agreement.

**PROGRAM:** The disciplines in the field of land use planning that are organized within the BLM and Forest Service to contribute to the management of public land. These disciplines include economics, rangeland, wildlife biology, botany, ecology, realty, law, and communication.

**PROGRAM EFFICIENCY:** How well a program is operated. Program efficiency is often judged on its budget, staffing, schedule and completion of projects, training, and how well a variety of programs work together on one or more projects.

**PROHIBITED ACTS:** Actions not allowed on federal lands.

**PROPERLY FUNCTIONING CONDITION:** Riparian-wetland areas are functioning



properly when adequate vegetation, landform, or large woody debris is present to dissipate stream energy associated with high waterflows, thereby reducing erosion and improving water quality; filter sediment, capture bedload, and aid floodplain development; improve floodwater retention and groundwater recharge; develop root masses that stabilize streambanks against cutting action; develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses; and support greater biodiversity. The functioning condition of riparian-wetland areas is influenced by geomorphic features, soil, water, and vegetation.

Uplands function properly when the existing vegetation and ground cover maintain soil conditions capable of sustaining natural biotic communities. The functioning condition of uplands is influenced by geographic features, soil, water, and vegetation.

Also see **NONFUNCTIONING CONDITION** and **FUNCTIONING AT RISK**.

**PUBLIC LAND LAW REVIEW COMMISSION (PLLRC):** The Commission established by Public Law 88-606 on September 19, 1964, to study existing laws and procedures relating to the administration of federal lands.

**PUBLIC LANDS:** As defined in Public Law 94-79, public lands are any land and interest in land outside of Alaska owned by the United States and administered by the Secretary of the Interior through BLM. In common usage, public lands may refer to all federal land no matter what agency has responsibility for its management.

**PUBLIC PARTICIPATION:** A procedure allowing citizens as individuals or interest groups to review proposed government procedures or information and offer suggestions, comments, and criticism, and help identify the issues and concerns associated with federal land management.

**PUBLIC RANGELANDS IMPROVEMENT ACT OF 1978 (PRIA):** An act that defines the cur-

rent grazing fee formula. The formula is based on a combination of fair market value, beef prices, and production costs.

**RAILING:** A mechanical vegetation treatment to improve rangeland for livestock grazing in which railroad rails connected by chain are extended between two tractors and dragged over the terrain to uproot brush and small trees such as pinyon and juniper. See **CHAINING**.

**RANGE OR RANGELAND:** Rangelands, forests and woodlands, and riparian zones that support an understory or periodic cover of herbaceous or shrubby vegetation amenable to rangeland management principles or practices.

**RANGE BETTERMENT FUND:** In this EIS, the money collected from livestock grazing on the federal lands and used for rangeland improvements. BLM actually calls these funds Range Improvement Funds and uses them solely for labor, materials, and final survey and design of projects. The Forest Service calls these funds Range Betterment Funds and uses them for planning and building rangeland improvements.

**RANGE CONDITION:** The current productivity of a rangeland relative to what it could naturally produce.

**RANGE IMPROVEMENT FUND:** See **RANGE BETTERMENT FUND**.

**RANGE FORAGE INDEX (RFI):** See **FORAGE VALUE INDEX**.

**RANGE IMPROVEMENT PERMIT:** For BLM an authorization to build a rangeland improvement on public land, synonymous with the Forest Service's term permit modification.

**RANGE IMPROVEMENT PROJECT:** See **RESOURCE IMPROVEMENT**.

**RANGELAND:** A kind of land on which the native vegetation, climax or natural potential consists predominately of grasses, grasslike plants, forbs, or shrubs. Rangeland includes lands revegetated naturally or artificially to provide a plant cover that is managed like



native vegetation. Rangelands may consist of natural grasslands, savannas, shrublands, most deserts, tundra, alpine communities, coastal marshes, and wet meadows.

**RANGELAND IMPROVEMENT:** See RESOURCE IMPROVEMENT.

**RANGELAND PRACTICES:** Practices that improve or maintain basic soil and vegetation resources. Rangeland practices typically consist of watershed treatments (planting, seeding, burning, rest, vegetation manipulation, grazing management) in an attempt to establish desired vegetation species or communities.

**RANGE USER:** A person or organization having a permit to graze livestock on federal lands.

**RAPTORS:** Birds of prey.

**RECORD OF DECISION:** A document signed by a responsible official recording a decisions that was preceded by the preparation of an environmental impact statement.

**RELICT:** A remnant or fragment of the vegetation of an area that remains from a former period when it was more widely distributed.

**RESIDENT FISH SPECIES:** Any fish species naturally occurring, either presently or historically, in any ecosystem of the United States.

**RESEARCH NATURL AREA (RNA):** a physical or biological unit of the public lands designated to protect specific natural conditions. On RNAs, activities such as grazing or vegetation manipulation are prohibited if they would harm the values being protected.

**RESIDUAL PLANT COVER:** Standing herbaceous vegetation that has cured and become decadent. When these plants fall, they become litter.

**RESOURCE IMPROVEMENT:** Any activity or program on or relating to the public lands that is designed to improve production of forage, change vegetation composition, control patterns of use, provide water, stabilize soil and water conditions, or provide habitat for livestock and wildlife. Resource im-

provements may be structural or nonstructural.

**Structural Improvement:** An improvement requiring placement or construction to facilitate the management or control the distribution and movement of animals. Such improvement may include fences, wells, trough, reservoirs, pipelines, and cattleguards.

**Nonstructural Improvement:** A practice or treatment that improves resource condition or production for multiple use. Such improvements may include seedings; chemical, mechanical, and biological plant control; prescribed burning; water spreaders; pitting; chiseling; and contour furrowing.

**RESOURCE MANAGEMENT PLAN (RMP):** A BLM planning document, prepared in accordance with Section 202 of the Federal Land Policy and Management Act, that presents systematic guidelines for making resource management decisions for a resource area. Based on an analysis of an area's resources, its existing management, and its capability for alternative uses, RMPs are issue oriented and developed by an interdisciplinary team with public participation.

**REST:** See GRAZING REST.

**RILL EROSION:** Removal of soil by running water forming shallow channels that can be smoothed out by normal cultivation.

**RIPARIAN:** Pertaining to or situated on or along the bank of a stream or other body of water.

**RIPARIAN ECOSYSTEM:** A transition between an aquatic ecosystem and an adjacent terrestrial ecosystem identified by soil characteristics or distinctive vegetation communities that require free or unbound water. Riparian ecosystems often occupy distinctive landscapes, such as floodplains or alluvial benches.

**RIPARIAN-WETLAND AREAS WITH MANAGEMENT OBJECTIVES:** Areas where BLM has established specific riparian-wetland objectives and has or will implement management actions to meet the objectives.



**RIPARIAN-WETLAND AREAS WITHOUT MANAGEMENT OBJECTIVES:** Areas that BLM is managing, but does not have specific objectives for riparian-wetland management or no specific management at all.

**RIVERINE:** Pertaining to or resembling a river.

**RUNOFF:** The portion of the precipitation of a drainage area that flows from the area.

**RUNOFF EVENT:** Any precipitation that results in runoff.

**SAFE RELEASE OF WATER:** A process in which water is discharged to ground water, surface water bodies, or overland flow in a manner that minimizes harmful consequences to ecosystem functions and values.

**SCOPING:** An early and open process for determining the scope of issues to be addressed in an EIS and for identifying the significant issues related to a proposed action.

**SEASON OF USE:** The time during which livestock grazing is permitted on a given range area, as specified in the grazing permit.

**SECONDARY CONTACT RECREATION:** Recreation activity in which contact with water is either incidental or accidental, such as fishing, boating, and walking close to the shore. See PRIMARY CONTACT RECREATION.

**SECTION 3 LANDS:** Public lands within a grazing district administered by BLM under Section 3 of the Taylor Grazing Act of 1934. BLM authorizes livestock grazing on these lands by issuing permits to permittees. Section 3 lands make up the vast majority of BLM-administered lands.

**SECTION 15 LANDS:** Public lands outside a grazing district administered by BLM under Section 15 of the Taylor Grazing Act of 1934. BLM authorizes livestock grazing on these lands by issuing licenses to licensees. Section 15 lands tend to be more isolated parcels that are harder to manage than Section 3 lands.

**SEDIMENTARY ROCK:** Rock formed from sediments or from transported fragments deposited in water.

**SEDIMENT YIELD:** The amount of sediment removed from a watershed over a specified period, usually expressed as tons, acre-feet, or cubic yards of sediment per unit of drainage area per year.

**SEMIARID REGION:** A region where precipitation is limited and whose plant life typically consists of short, drought-resistant grasses. Semiarid regions are highly susceptible to severe drought.

**SENSITIVE AREAS:** In this EIS, areas sensitive to livestock grazing where such grazing would not be allowed under the Environmental Enhancement alternative. Such areas include designated wilderness, wilderness study areas, developed recreation sites, threatened and endangered species habitat, and areas of national and historic cultural significance.

**SENSITIVE SPECIES:** All species that are under status review, have small or declining populations, or live in unique habitats. May also be any species needing special management. Sensitive species include threatened, endangered, and proposed species as classified by the Fish and Wildlife Service. In the Forest Service, sensitive species are designated by regional foresters.

**SERAL:** Pertaining to the successional stages of biotic communities.

**SERAL (SUCCESSIONAL) COMMUNITY:** One of a series of biotic communities that follow one another in time on any given ecological site.

**SHEET EROSION:** The removal of a fairly uniform layer of soil or materials from the land surface by the action of rainfall and runoff water.

**SHRUBSTEPPE:** See SOUTHWEST SHRUBSTEPPE.



**SINGLE FEE:** One fee for grazing on both BLM- and Forest Service-administered land.

**SOIL HORIZON:** A layer of soil or soil material roughly parallel to the land surface and differing from adjacent, genetically related layers in physical, chemical, and biological properties or characteristics, such as color, structure, texture, consistence, degree of acidity or alkalinity, and kinds and numbers of organisms present.

**SOIL MOISTURE:** The water content stored in a soil.

**SOIL PRODUCTIVITY:** A soil's capability of producing a specified plant or sequence of plants under a specified system of management.

**SOIL PROFILE:** A vertical section of the soil from the surface through all its horizons.

**SOIL STRUCTURE:** The physical constitution of soil material as expressed by size, shape, and the degree of development of primary soil particles and voids into naturally or artificially formed structural units.

**SOIL TEXTURE:** The relative proportions of the three size groups of soil grains (sand, silt, and clay) in a mass of soil.

**SOUTHWEST SHRUBSTEPPE:** A vegetation type occupying the semidesert grasslands of southeast Arizona, southern New Mexico, and the Chihuahuan Desert.

**SPAWNING GRAVELS:** Stream-bottom gravel where fish deposit and fertilize their eggs. The covering of these gravels with silt can block the supply of oxygen to the eggs or serve as a cementing agent to prevent fry from emerging.

**SPECIAL STATUS SPECIES:** Plant or animal species listed as threatened, endangered, candidate, or sensitive by federal or state governments. See also SENSITIVE SPECIES, KEYSTONE SPECIES, and KEY SPECIES.

**STANDARD:** Minimum acceptable level used to measure success in achieving an objective.

**STAY:** The deferral of a decision pending an administrative review.

**STEWARDSHIP:** An individual's responsibility to manage natural resources on public land.

**STOCKING:** The act of placing livestock on rangeland.

**STOCKING RATE:** The number of specific kinds and classes of animals grazing or using a unit of land for a specified time. Not the same as carrying capacity.

**STOCKWATER DEVELOPMENT:** New or improved livestock watering sources on the rangeland, such as wells, ponds, and springs, together with storage and delivery system.

**STORAGE (OF SOIL MOISTURE):** The process in which water is retained in the soil for use by plants and soil organisms or accumulates to recharge ground water or discharge to surface water.

**STREAM ENERGY:** The potential of flowing water, at a given time and place, to detach and transport solid particles.

**STRUCTURAL DIVERSITY:** The diversity of the composition, abundance, spacing, and other attributes of plants in a community.

**SUCCESSION:** See ECOLOGICAL SUCCESSION.

**SUITABILITY:** The adaptability of a particular plant or animal species to a given ecological site.

**SUITABILITY CRITERIA:** In protecting a site from resource damage, the standards for judging whether a rangeland should be accessible to a specific kind of animal.

**SUITABILITY THRESHOLDS:** A level, point, or value above which rangeland is not accessible to a kind of animal without causing resource damage. Above the threshold something is true or will take place. Below it something is not true or will not take place.

**SUITABLE RANGE:** Rangeland that is accessible to a specific kind of animal and that can be



grazed on a sustained yield basis without damage to the resource.

**SUMMER RANGE:** A type of rangeland that is accessible to livestock and normally grazed during the summer grazing season.

**SUPPLEMENTAL FEED:** Nutritional additives (salt, minerals, vitamins, protein blocks) or harvested forage given to livestock on federal rangelands to correct dietary deficiencies.

**SUPPLEMENTAL BILLING NOTICE:** A replacement or additional billing notice.

**SUSCEPTIBLE TO DEGRADATION:** See **FUNCTIONING AT RISK**. Also see **PROPER FUNCTIONING CONDITION** and **NONFUNCTIONING CONDITION**.

**SUSPENDED NONUSE:** Forage from BLM-administered land that at one time could be grazed by livestock, but was later suspended from grazing because an evaluation showed that the rangeland could not support that level of grazing. Although suspended forage cannot be used, it remains as part of the total number of animal unit months of forage on grazing permits.

**SUSTAINED USE (PRODUCTION):** The continuation of livestock grazing at a uniform level while maintaining a healthy desired plant community.

**SUSTAINED YIELD:** The continuation of a healthy desired plant community.

**TAKE:** As defined by the Endangered Species Act, "to harass, harm, pursue, hunt, shoot, wound, kill, capture, or collect, or attempt to engage in any such conduct."

**TAKING:** In Anglo-American legal tradition, the right of eminent domain—the right of the sovereign or government to take private property to meet public needs. The takings clause of the Fifth Amendment to the U.S. Constitution prohibits the taking of private property for public use without just compensation. But recently, under the concept of regulatory taking, landowners have been demanding that the government pay them

for losses resulting from regulations that have reduced profits from the use of their land.

**TAYLOR GRAZING ACT OF 1934 (TGA):** The Act of June 28, 1934, providing for the regulation of grazing on the public lands (excluding Alaska) to improve rangeland conditions and stabilize the western livestock industry. The law permitted 80 million acres to be placed into grazing district to be administered by the Department of the Interior's Division of Grazing (later renamed the Grazing Service). The General Land Office was responsible for administering grazing on public lands outside the districts. TGA conferred broad powers on the Secretary of the Interior to do all things needed for the preservation and use of the unreserved public lands of the United States.

**TENURE:** The act, right, or term of holding landed property.

**TERM PERMIT:** A document authorizing grazing for a stated number of years (usually 10) as contrasted to an annual or temporary permit.

**THREATENED SPECIES:** Any plant or animal species likely to become endangered within the foreseeable future throughout all or a part of its range as designated by the U.S. Fish and Wildlife Service under the Endangered Species Act. See **ENDANGERED SPECIES**.

**THREATENED AND ENDANGERED RECOVERY:** Improvement in the status of a threatened or endangered species to the point that it no longer needs to be listed.

**THREATENED AND ENDANGERED RESTORATION:** See **THREATENED AND ENDANGERED RECOVERY**.

**TOTAL DISSOLVED SOLIDS:** Salt—an aggregate of carbonates, bicarbonates, chlorides, sulfates, phosphates, and nitrates of calcium, magnesium, manganese, sodium, potassium, and other cations that form salts. High TDS solutions can change the chemical nature of water, exert varying degrees of os-



otic pressure, and often become lethal to aquatic life.

**TOTAL SUSPENDED PARTICULATES:** Any particles in the atmosphere that are less than roughly 50 micrometers in diameter and that settle slowly, including droplets, dust, fumes, pollen, sand, and soot.

**TRADITIONAL LIFEWAY VALUE:** A value that is important for maintaining a specific group's traditional system of religious belief, cultural practice, or social interaction. A group's shared traditional lifeway values are abstract, nonmaterial, ascribed ideas that cannot be discovered except through discussions with members of the group. These values may or may not be closely associated with definite locations.

**TRAILING:** (1) Controlled directional movement of livestock. (2) Natural trailing is the habit of livestock or wildlife repeatedly treading in the same line or path.

**TRAILING PERMIT:** See CROSSING PERMIT.

**TRANSPIRATION:** The photosynthetic and physiological process by which water in plants is transferred as water vapor to the atmosphere.

**TRESPASS:** An unauthorized use of federal lands or resources. See UNAUTHORIZED USE.

**UNAUTHORIZED USE:** Any use of the public land not authorized or permitted.

**UNDERSTORY:** Plants growing beneath the canopy of other plants, usually grasses, forbs, and low shrubs.

**UNDEVELOPED RECREATION SITE:** A often used outdoor recreation site that has no facilities, structures, or improvements, such as picnic tables, restrooms, or water fountains. Examples might include a primitive campsite with nothing more than firerings or popular swimming holes or beaches. See DEVELOPED RECREATION SITE.

**UNGULATES:** Hoofed animals, including ruminants but also horses, tapirs, elephants, rhinoceroses, and swine.

**UNSUITABLE RANGE:** Rangeland that is not accessible to a specific kind of animal and that cannot be grazed on a sustained yield basis without damaging the resource.

**UPLAND GAME:** A term used in wildlife management to refer to hunted animals that are neither big game nor waterfowl. Upland game includes such birds as grouse, turkey, pheasant, quail, and dove, and such mammals as rabbit and squirrel.

**UPLANDS:** Land at a higher elevation than the alluvial plain or low stream terrace; all lands outside the riparian-wetland and aquatic zones.

**UTILIZATION:** The proportion of a year's forage production that is consumed or destroyed by grazing animals.

**VACANT ALLOTMENT:** An allotment for which a grazing permit or license has not been issued.

**VARIABLE FEE:** A grazing fee based on local characteristics such as topography, season of grazing use, quality or amount of forage, and distance between water sources. A variable fee may also apply to class and age of grazing livestock in relationship to a base unit of one cow without calf.

**VEGETATION:** Plants in general, or the sum total of the plant life above and below the soil surface in an area.

**VEGETATIVE REPRODUCTION:** Production of new plants by any asexual methods, such as root networks, stolons, and rhizomes.

**VIGOR:** The capacity for natural growth and survival of plants and animals.

**WARM-SEASON SPECIES:** Plants whose major growth occurs during the spring, summer, or fall, and are usually dormant in winter. See COOL-SEASON SPECIES.

**WATER-BASED ALLOTMENT:** An allotment whose permit is based on the ownership of livestock water sources instead of land, with grazing use dependent upon each source.



**WATER QUALITY STANDARDS:** Standards for water quality established under Section 303 of the Clean Water Act. The water quality standards program is covered by an implementing regulation in 40 CFR 131. A water quality standard is a rule or law consisting of three elements: (1) the designated use (or uses) to be made of the water body or segment; (2) the water quality criteria needed to protect that use (or uses); and (3) an antidegradation policy. Standards are to protect the public health or welfare, improve water quality, and serve the purpose of the Clean Water Act. Criteria are usually established thresholds that when violated are intended to reveal harm to beneficial uses of water.

**WATERSHED:** The total area above a given point on a waterway that contributes runoff water to the streamflow at that point.

**WATER YIELD:** The runoff from a watershed, including groundwater outflow, which amounts to precipitation minus evapotranspiration. See **EVAPOTRANSPIRATION**.

**WEIGHTED AVERAGE:** An average in which each component is adjusted by a factor that reflects its relative importance to the whole; obtained by multiply each component by its assigned weight, adding the products, and dividing the sum of the weights.

**WESTWIDE:** A term used in this EIS to refer to the 17 western states in which livestock graze BLM- and Forest-Service administered lands. These states are Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming

**WETLANDS:** Permanently wet or intermittently water-covered areas, such as swamps, marshes, bogs, muskogs, potholes, swales, and glades.

**WILD HORSES AND BURROS (WILD FREE-ROAMING HORSES AND BURROS):** All unbranded and unclaimed horses and bur-

ros using public lands as all or part of their habitat.

**WILDERNESS AREA:** An area designated by Congress where the earth and its community of life are untrammelled by humans, where people are visitors who do not remain. An area of undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation, that is protected and managed to preserve its natural conditions and that (1) generally appears to have been affected primarily by the forces of nature, with human imprints substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least 5,000 acres of land or is large enough to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

**WILDERNESS STUDY AREA:** (1) On BLM-managed lands, a roadless area that has been inventoried (but not designated by Congress) and found to have wilderness characteristics as described in Section 603 of the Federal Land Policy and Management Act of 1976 and Section 2(c) of the Wilderness Act of 1964. (2) On National Forest System lands, a roadless area designated by Congress for further evaluation and recommendation by the Forest Service.

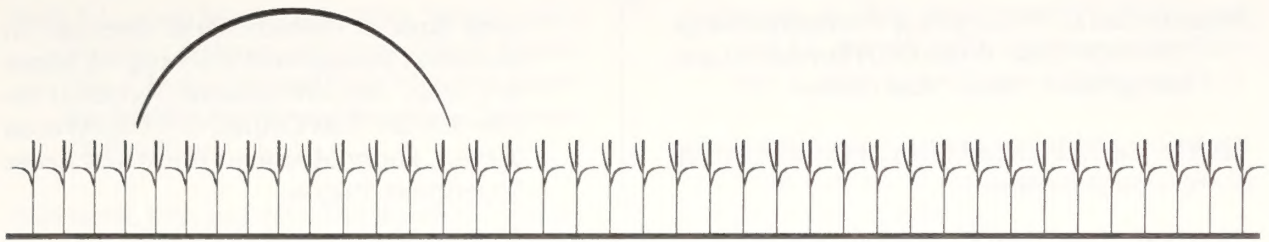
**WOODY:** Consisting of wood such as trees or bushes.

**XERIC:** Of, characterized by, or adapted to an extremely dry habitat.

**XEROPHYTIC:** Growing in and adapted to an environment deficient in moisture.

**YEAR-LONG GRAZING:** Continuous grazing for a calendar year.





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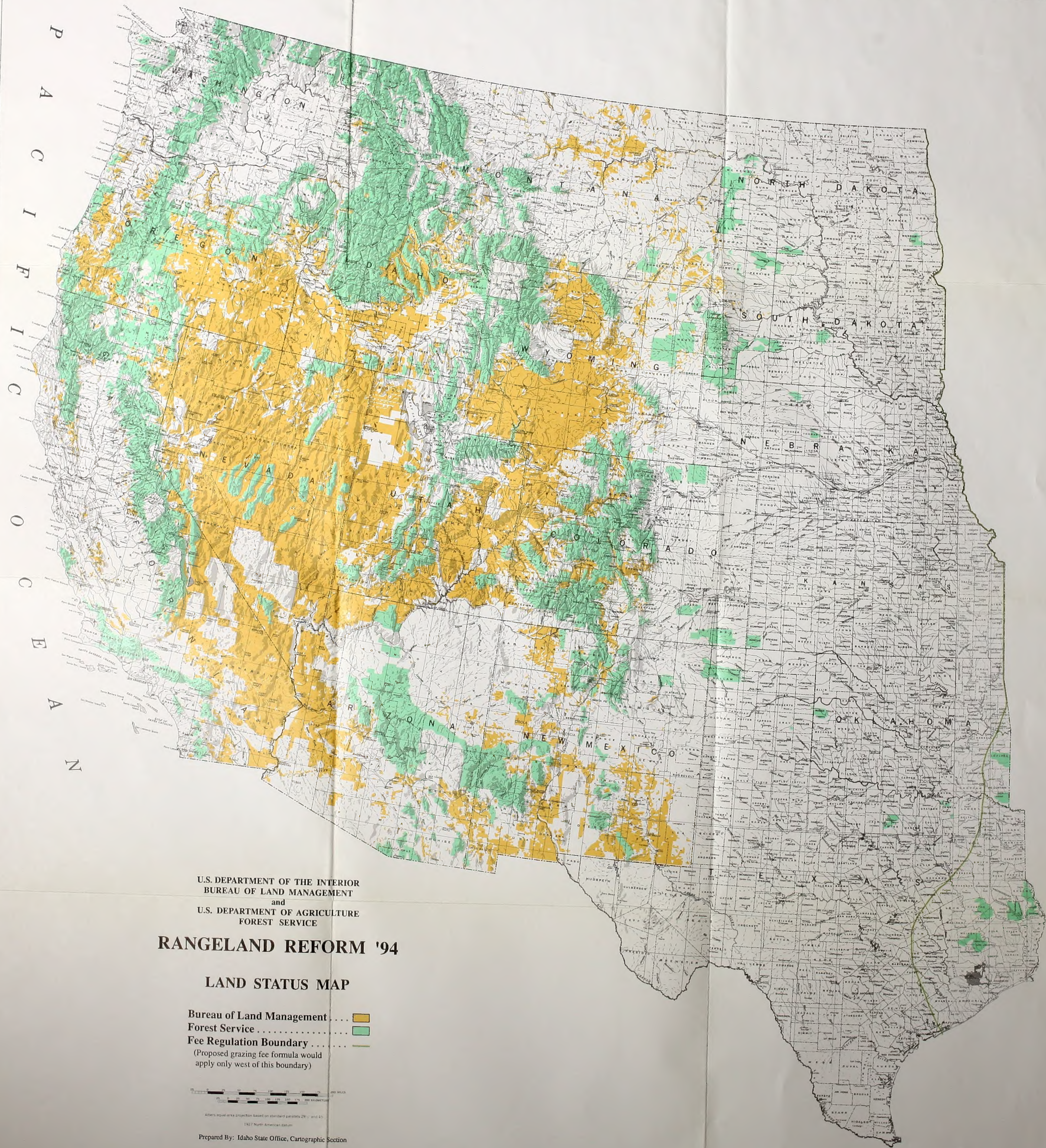
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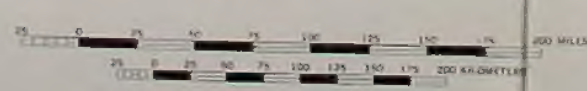


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## RANGELAND REFORM '94

### LAND STATUS MAP

- Bureau of Land Management . . . . .
  - Forest Service . . . . .
  - Fee Regulation Boundary . . . . .
- (Proposed grazing fee formula would apply only west of this boundary)



Albers equal area projection based on standard parallels 29° and 45°  
1927 North American datum

Prepared By: Idaho State Office, Cartographic Section

October 1993



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